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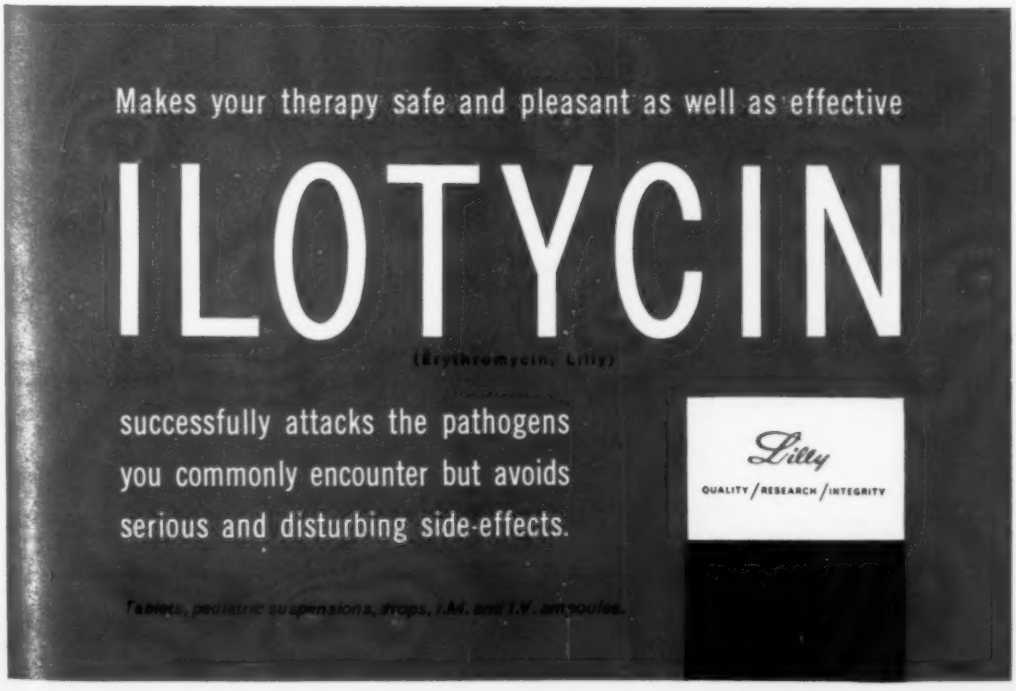
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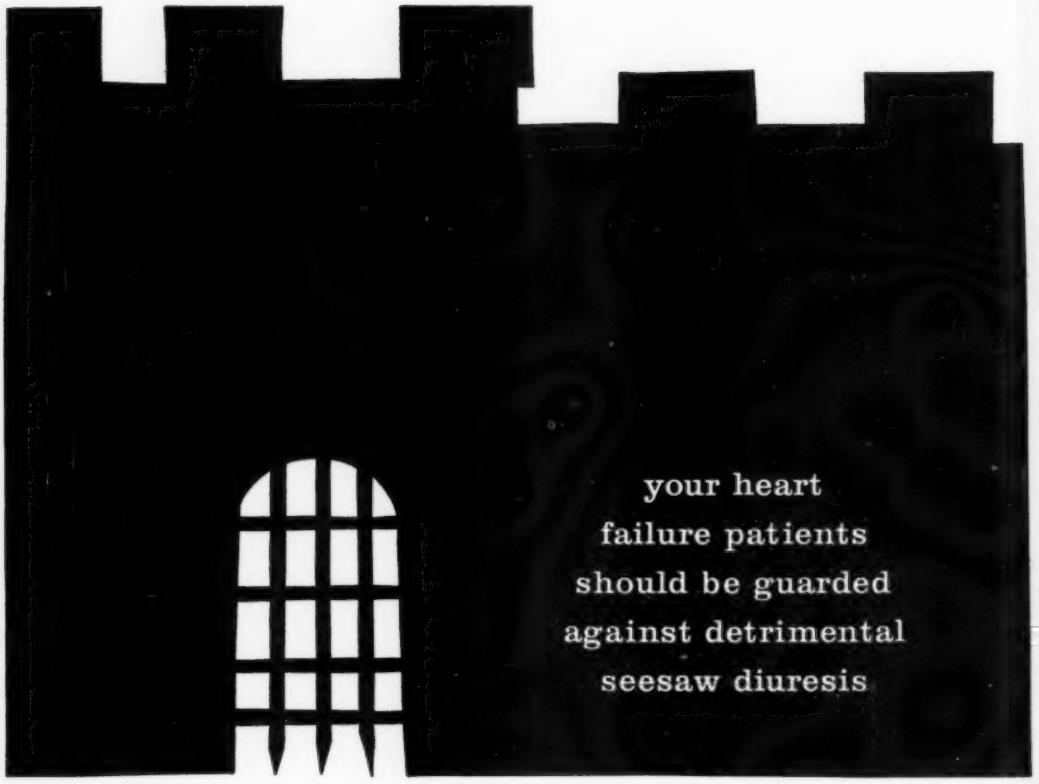

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CONTENTS

ORIGINAL ARTICLES

Aneurysms and Acquired Occlusive Disease of the Aorta — *Dr. Denton A. Cooley, Dr. Michael E. De Bakey, and Dr. Oscar Creech, Jr.* ---- 387

A Review of The Cardiovascular Effects of Hypothermia—Part II— *Dr. Theodore G. Brown, Jr.* ---- 390

MEDICAL COLLEGE CLINICS

Electrocardiogram of The Month—Mitral Stenosis — *Dr. Dale Groom* ---- 399

Interstitial Pregnancy—A Case Report — *Dr. Lawrence L. Hester, Jr., and Dr. Julian A. Salley* ---- 401

Pathological Conference of The Medical College of South Carolina —*Dr. H. R. Pratt-Thomas* ---- 402

EDITORIALS

Do You Want Social Security? ---- 407

A Man's Contribution To His Community ---- 407

Licensure ---- 408

Disability Insurance Benefits Under Social Security ---- 411

FEATURES

President's Page ---- 406

Press Comment ---- 412

Announcements ---- 413

Correspondence ---- 414

Deaths ---- 414

News ---- 415

Book Reviews ---- 417

Woman's Auxiliary ---- 420

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ANEURYSMS AND ACQUIRED OCCLUSIVE DISEASE OF THE AORTA

DENTON A. COOLEY, M. D., MICHAEL E. DE BAKEY, M. D.,

AND OSCAR CREECH, JR., M. D.*

Aneurysms and occlusive disease of the aorta constitute the most common and serious forms of aortic disease. Prognosis in both is poor and the symptoms produced are both serious and disabling. Death in aortic aneurysm usually results from aortic rupture and hemorrhage. Thrombo-obliterative disease, although not so lethal as aneurysm, produces progressive arterial insufficiency, possible gangrene of the lower extremities, and death from renal failure may ensue. Until relatively recently the surgical treatment of acquired aortic disease was unsatisfactory and effective palliation of symptoms was obtained in only a small proportion of cases. Recently, however, with the improvements in technics of vascular surgery, excisional treatment has been demonstrated to be a feasible and satisfactory means of dealing with such lesions. The purpose of this presentation is to discuss the methods of surgical treatment being used at present in treatment of aortic lesions and to make certain observations based upon our experience with 482 patients operated upon during the past five years.

Aneurysms

Aneurysms of the aorta may be either sacciform or fusiform in type and arteriosclerotic in origin. The grave prognosis in aortic aneurysm has long been recognized, and although this outlook varies somewhat depending upon the location and type of lesion, life expectancy in the majority of patients is less than one year from the original date of diagnosis. Various methods of medical and surgical treatment have been advocated from time to time in the past, but none has been very effective. At present, excision of aortic aneurysm offers the only curative method of treatment, and technics of aneurysmectomy are now relatively well developed. For sacciform aneurysms tangential excision of the lesion from the adjacent aortic wall with lateral aortorrhaphy is standard, particularly if it is located in the ascending thoracic aorta. Frequently in cases of this type severe pain results from encroachment upon mediastinal structures or sternal erosion, and complete relief of symptoms may be expected after removal of the anurysm.

For fusiform aneurysm segmental resection of the aorta with replacement by homograft or synthetic prosthesis is used for lesions of the aortic arch, descending thoracic aorta, or abdominal aorta. Temporary aortic occlusion at these levels may be tolerated for varying periods of time during performance of the excision and grafting procedure. For aneurysms located in the proximal descending thoracic aorta, general body hypothermia should be used to prevent ischemic spinal cord damage during the period of aortic occlusion. Temporary by-pass shunts are used when the resection involves the aortic arch and carotid arteries or the proximal abdominal aorta and

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renal arteries in order to prevent cerebral or renal complications.

Arteriosclerotic aneurysms of the abdominal aorta characteristically involve the segment of aorta distal to the renal arteries extending to the aortic bifurcation and frequently the iliac arteries. In fact, the anatomic location of these lesions has been so uniform that it is no longer necessary to employ diagnostic aortography to determine operability, since among 215 abdominal aneurysms only three extended above the renal arteries proximally. Aortic occlusion at this level is well tolerated, and there is apparently only an insignificant threat of ischemic damage to distal tissues. Thus, hypothermia is not used for abdominal aneurysms.

Although death is almost inevitable following acute rupture of an abdominal aneurysm, many patients will survive for several hours or rarely for two or three days after perforation during which period emergency operation may lead to recovery. If a diagnosis of ruptured aortic aneurysm is made, operation should be undertaken promptly without elaborate measures to control shock. At the time of operation the patient's condition usually improves dramatically when the clamp is applied to the proximal aorta. Resuscitation from shock is then possible by using large amounts of blood augmented by vasopressor substance if necessary.

Dissecting aneurysm is a unique form of aortic disease in which partial rupture of the aorta may occur with separation of the medial coat and intramural spread of hematoma. Symptoms depend upon the extent and course of the dissection which usually originates in the ascending aorta or in the proximal descending thoracic aorta. In the most acute and severe form of the disease there is rapid dissection with death due to perforation of the outer lumen into the pericardium, mediastinum, pleura, or peritoneum. Uremia may occur if occlusion of renal arteries is produced by compression from the false lumen. In some cases a re-entry opening into the true lumen of the aorta occurs spontaneously and the dissecting process is automatically controlled, the aneurysm thus assuming the so-called "healed" or chronic stage. Whereas death occurs in 75 to 90 per cent of all cases of dissecting aneurysm, the remaining 10 per cent survive the acute phase for several months and sometimes years. Recently surgical treatment has been possible for dissecting aneurysms, the approach being directed toward creating a reentry passage into the true lumen, thus obliterating the false lumen distally. In cases where the origin of the dissecting process is located distal to the origin of the left subclavian artery, a localized fusiform aneurysm is usually present which is resected and replaced by homograft or prosthesis after obliterating the distal false lumen by sutures. Most dissecting aneurysms occur in hypertensive patients, and after operation an effort should be made to control blood pressure to prevent further aortic dissection.

Acquired Occlusive Disease

Arteriosclerotic occlusive disease of the aorta most commonly affects the bifurcation, and Leriche more than 25 years ago described a syndrome of insidious thrombosis at this site. The common iliac arteries are apparently the site of predilection for the occlusive process which frequently extends proximally to the level of the renal arteries. Although renal insufficiency and uremia may result from this progressive thrombosis, most commonly the symptoms are related to arterial insufficiency in the pelvis and lower extremities. Thus, patients complain of sexual impotence and intermittent claudication involving primarily the hips and thighs. The disease usually affects males in the fifth and sixth decades.

The tendency for the occlusive process to remain confined to the aortic bifurcation and common iliac arteries is a favorable pathologic feature of the disease since repair or replacement of this area may completely restore circulation distally. Several methods of treatment may be satisfactory depending upon the extent and character of the disease. Thromboendarterectomy may be accomplished in well localized occlusions if the outer coats of the vessel are not involved. By carefully developing a plane of dissection the intimal and medial thrombosis and calcification may be peeled away. Resection of the aorta and iliac arteries must be done in many cases because

of extensive involvement of the vessel wall or where aneurysm coexists. The method of replacement under these circumstances is similar to that used in abdominal aneurysms. Still another method of treatment frequently employed is the use of permanent by-pass shunts around the occlusion. This latter method is particularly well suited to cases of diffuse incomplete occlusions involving also the external iliac arteries. Aortic to femoral artery by-pass shunts are effective in such cases and collateral blood supply is not sacrificed. By-pass procedures are usually easier to accomplish technically and are used more than any of the other methods at the present.

TABLE I

	No. Cases	No. Deaths	Per Cent
Aneurysms			
Thoracic Aorta			
Sacciform	22	8	36
Fusiform	35	12	34
Dissecting	15	3	20
Abdominal Aorta			
Ruptured	27	9	33
Nonruptured	188	16	8
Occlusive Disease			
Thoracic Aorta	18	1	6
Abdominal Aorta	176	7	4
Neoplasm	1	0	--
Total	482	56	11

Results

During the period from July 1, 1951, to May 1, 1956, we operated upon 482 cases of aortic disease exclusive of simple adult type coarctations (Table I). As seen from the table of results operative mortality for aneurysms is significantly higher than for occlusive disease because of a number of factors. For example, average age in the patients with aneurysm was significantly higher than the group with occlusive disease, and frequently there were complicating cardio-respiratory and renal factors which limited the patient's ability to withstand major surgical procedures. Indeed, many of the patients were in the terminal stages of their aortic disease at the time of operation. For example, 27 patients were operated upon following acute rupture of an abdominal aneurysm. In this group death occurred after operation in 9 patients, usually due to renal failure, but salvage of the remaining 18 patients (67 per cent) was particularly significant in these hopelessly doomed cases. Similar circumstances account for the mortality in dissecting thoracic aneurysms, but again 80 per cent of these patients survived this serious form of aortic disease and are relatively free of symptoms and well at the present. Patients in this series of operations for aneurysm were an unselected group in which operation was undertaken with scant regard for age, history of renal, cardiac or pulmonary disease. It is not surprising that mortality following operation for abdominal aneurysm was twice as high in patients more than 70 years of age than for younger patients. Particularly gratifying, however, is the fact that with increasing experience significant improvement in operative mortality has resulted. This is exemplified by the progressive decrease in mortality from over 20 per cent in our early experience to less than 5 per cent during the past two years. Indeed, in the past 50 consecutive cases of abdominal aneurysm there has not been a death. In those patients followed for periods of one to three years the results have been good in most cases without recurrence of aneurysm.

Results following operation for thromboobliterative disease of the aorta have been highly gratifying. Prompt relief of manifestations of arterial insufficiency were observed with restoration of pulses in the lower extremity in well over 90 per cent of cases. Moreover, follow-up observations extending over several years indicate that these good results are maintained in the majority of patients. The risk of operation in abdominal occlusions is only 4 per cent, further justifying our conviction that operations of these types are indicated for this condition.

HYPOTHERMIA

A Review of The Cardiovascular Effects of Hypothemia*

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PART II*

One of the inevitable consequences of deepening hypothermia is ventricular fibrillation. The primary cause is completely unknown. Attempts to find the primary cause as well as possible contributing secondary factors have not been very successful. Hegnauer, D'Amato and Flynn (1951) have reported that the presence of cardiac catheters increases the incidence of fibrillation. Riley, Barila and Hughes (1956) reported that with thiopental anesthesia in immersion hypothermia experiments on dogs, there was a lower incidence of ventricular fibrillation and a lower mean temperature at which the fibrillation occurred when compared to pentobarbital anesthesia. Others have reported that results with ether were similar to those obtained from thiopental.

Attempts to prevent ventricular fibrillation or to reverse existing fibrillation have been met with varying degrees of success. Covino, Charleson and D'Amato (1954) failed to protect hypothermic dogs from fibrillating with the use of adrenergic blocking agents or venesection. In a recent study Covino, Wright and Charleson (1955) have presented evidence to show that Dacorene, B-(2 biphenyloxy)-ethyl-diethylamine HCl, an antifibrillatory drug, may be useful in preventing ventricular fibrillation in the hypothermic dog. In the same study they showed that diphenylhydantoin (Dilantin) was ineffective in controlling fibrillation at non-toxic dose levels and that procaine amide induced fibrillation in all hypothermic dogs tested. Prevedel, Montgomery and Swan (1954) have stated that neostigmine (Prostigmine) was an effective antifibrillatory agent when given by coronary perfusion, and that when used by this method in the fibrillating animal will allow conversion to a normal rhythm by massage and electric shock. Senning and Kaplan (1956) were able to demonstrate that intravenous alcohol in young dogs decreased the incidence of spontaneous ventricular fibrillation during cardiac occlusion.

Brewin (1954) in England has defibrillated dogs with intraventricular injections of norepinephrine, massage and electric shock. Schafer, Hughes and Darila (1955) in recent studies have defibrillated dogs which had fibrillated for as long as four to five hours with massage, warm saline bathing of the pleural cavity and electric shock. These most interesting experiments indicate that fibrillation of long standing in the hypothermic animal can be reversed successfully. Kirby, Jenson and Johnson (1954) have also reported successful attempts at reversing fibrillation with coronary perfusion of Prostigmine.

Senning (1952 and 1955), on the other hand, has induced ventricular fibrillation in dogs cooled to 25.5° to 28°C. After carrying out various surgical procedures he has reversed the fibrillation with massage, procaine injection into the right auricle followed by epinephrine and finally electric shock. Upon conversion of the ventricular fibrillation the dogs were rewarmed. All animals (ten) survived the procedure. Senning concludes that if controlled properly, ventricular fibrillation makes it easier to perform the intracardiac surgery and that the procedure is less harmful to the fibrillating heart than to a slow, strongly-beating heart. Shumway and Lewis (1956) have recently carried out a similar study involving 82 dogs and obtained essentially the same results. They do not concur, however, with Senning's thesis that induced ventricular fibrillation should be done in clinical cases. They feel that the clinician should be prepared to accept the risk of ventricular fibrillation in performing surgery under conditions of hypothermia, and that with maintenance of adequate oxygenation of the myocardium reversal of ventricular fibrillation can be easily accomplished.

Niazi and Lewis (1954) in a series of papers

*Part I of this review appeared in the preceding issue of this Journal.

have attempted to prevent fibrillation by varying the degree and type of respiratory ventilation. They have found that 5 per cent carbon dioxide and oxygen and good ventilation, as opposed to hyperventilation with 100 per cent oxygen, maintained blood pH at normal or slightly above normal levels and decreased the incidence of fibrillation. On the other hand, if cardiac standstill can be achieved and maintained, the experimental animal (dog) can safely be taken to lower hypothermic temperatures. This was best achieved with oxygen and carbon dioxide (5 to 10 per cent) mixtures and good ventilation. In such a manner blood pH changed from normal levels to high levels (7.7 to 8.1) at about 25°C. and standstill was accomplished shortly thereafter. In this way, the hypothermic dog could be safely taken to temperature levels below 10°C.

Recent studies of ventricular fibrillation have presented some interesting results. Riberi *et al.* (1955) and Riberi, Siderys and Shumaker (1956) have shown that sino-auricular blockade with procaine was very effective in preventing ventricular fibrillation in healthy hypothermic dogs. The animals were subjected to external and internal cardiac stimuli. The results showed that of eleven untreated control animals, nine died of fibrillation, while of eleven procaine-treated animals only two died, and in each instance the death was due to post-operative respiratory complications and not to ventricular fibrillation. In a second paper by the same group of investigators, Shumaker *et al.* (1956) showed that bilateral sympathetic denervation of the heart prevented fibrillation in all of fifteen dogs treated in this manner. A second series of fifteen dogs was treated with intravenous or intracardiac trimethaphan camphorsulfonate (Arfonad) prior to cardiac surgery and only two developed fibrillation. Further studies demonstrated that stimulation of the right vagus nerve provoking adequate bradycardia prevented fibrillation in ten of fifteen animals, while complete cardiac denervation prevented fibrillation in nine of fifteen animals studied.

Electrolyte changes during hypothermia have been studied by many investigators. Fleming (1954) and McMillan *et al.* (1955) found small changes in serum potassium, both increases and decreases; whereas Bigelow, Lindsay and Greenwood (1950), Elliott and Crimson (1947), Swan *et al.* (1953) and Osborn (1953) found relatively large changes, both increases and decreases. MacKay (1947) working with cats, found a correlation between potassium and carbon dioxide levels, while McMillan *et al.* (1955) have not been able to demonstrate such a correlation. It should be emphasized, however, that all shivering was prevented in the animals used by McMillan and since shivering promotes glycogenolysis and a concomitant potassium release, it is very probable that the elimination of shivering was responsible for those cases where negligible changes in potassium levels were observed. Elliott and Crimson (1947) have shown that the administration of an amount of potassium which at normal body temperatures is without effect may cause lethal cardiac effects at 25°C. Garb (1951) has shown that with the cat papillary muscle preparation at normal temperatures potassium changes in the perfusion bath are principally effective in bringing about changes in the irritability of the heart. It has essentially no effect on the contractile force of the muscle mass.

Conn and Robertson (1955) using radiopotassium (K^{42}) have attempted to study the kinetics of potassium transfer in the myocardium of the intact, anesthetized dog. Their results indicate that there is a gradient between the plasma potassium of the coronary circulation and the intracellular myocardial potassium. The interstitial fluid potassium is less than the intracellular fluid potassium of the left ventricle. The energy involved in maintaining this intracellular-interstitial concentration gradient can be approximated, although the efficiency of the system is unknown. The calories expended may also simultaneously accomplish additional work such as transporting other ion species in the opposite direction. No consideration was given to electrical gradients or exchange diffusion, and these processes may play a major role in the exchange. This study is particularly interesting because of the possible importance of change in such a system occuring during marked reduction in tempera-

ture as in hypothermia. It is possible that observed shifts in the plasma potassium seen during hypothermia may be accounted for by such a system. A recent study of the effects of acute respiratory acidosis on the internal equilibrium of potassium by Schriber, Fremont-Smith and Burnell (1955) has shown that the internal equilibrium of potassium is in part a function of pH. They have demonstrated that with acidosis there is an increase in the extracellular-intracellular concentration ratio of potassium, and with alkalosis there is a corresponding decrease in this ratio. The altered ratio persists as long as the pH remains altered.

All investigators have observed a rise in serum calcium. The degree of increase reported has not been consistent, although all have found a definite increase. It is known that an excess of calcium leads to prolongation of systole, whereas potassium has the effect of prolonging diastole. It may be argued, as by McMillan *et al.* (1955), that the observed rise in serum calcium, which would tend to increase the power of systolic contraction of the myocardium and diminish relaxation, would produce precisely the effect observed by Hegnauer, Flynn and D'Amato (1951) during their hypothermic experiments. They found that under hypothermic conditions with a slow heart rate the period of systole was lengthened in relation to diastole, thus giving the heart little time for full relaxation in diastole and, hence, for coronary circulation. This is quite different from the slow heart rate of the hibernating animal, as reported by Lyman (1951), which has a normal systole and a long diastole. Berne (1954) has observed the same general ventricular time relations as those given by Hegnauer.

Since the calcium/potassium ratio rises in hypothermia and it has been shown that the heart is extremely sensitive to these cations at low body temperatures, it may be that changes considered to be inconsequential at normal body temperatures become lethal at a low body temperature. This condition combined with an insufficient coronary flow and hence possible anoxemia of the myocardium, may be enough to precipitate ventricular fibrillation or cardiac arrest. Swan and Zeavin (1954) and Zeavin, Virtue and Swan (1954) have shown that intra-aortic injections of potassium close to the coronary outflow and aided by cardiac massage reverse ventricular fibrillation in many cases. It may be that the injection of potassium effects this by restoring the calcium/potassium ratio. Grumbach, Howard and Merrill (1954) working with the perfused rabbit heart at normal temperature found that decreases in potassium in the face of no change in calcium, or an increase in calcium alone, precipitated spontaneous ventricular fibrillation.

In a recent study Covino and Hegnauer (1955) have studied the coronary A-V electrolyte differences in normal and hypothermic dogs. Sodium, potassium, calcium, magnesium, chloride and hydrogen ion concentration were determined. In dogs cooled to 24°C. which did not show ventricular fibrillation, there were no electrolyte changes. Ten dogs, made hypothermic, showed characteristic changes in calcium, potassium and hydrogen ion at 24°C. All these animals developed ventricular fibrillation and died, although no indication is given as to whether attempts were made to convert the arrhythmia to a normal sinus rhythm. It is suggested from this study that ventricular fibrillation at low temperature is related to an increase in calcium and a loss of potassium and hydrogen by the hypothermic, hypercapneic myocardium.

Because of its relation to electrolyte balance, renal function has been indirectly linked to the cardiovascular and electrolytic changes observed by many investigators during hypothermia. It has been shown by Nedzell (1952) that during hypothermia rabbit kidney function is seriously impaired. Bergstrand and Sterky (1954) in their studies found that the rabbit renal function paralleled the decrease in temperature with a decrease in oxygen consumption of the kidneys at low temperatures, but the oxygen content and A-V saturation of the blood was not altered. Anderson and Nielson (1955), using the rabbit, found a decrease in urine output, filtration, concentrating capacity and per cent reabsorption of urea. They attribute the decrease in

filtration and urine output to the decrease in blood flow resulting from the decrease in blood pressure and also to vasoconstriction within the kidney. The impairment of concentrating capacity and urea reabsorption is believed to be due to a decrease in the permeability of the nephrons directly affected by cold.

Page (1955) is the first investigator to publish detailed studies of the effects of hypothermia on renal function in the dog. In his experiments shivering occurred in all dogs. When placed in the cold, renal plasma flow and renal blood flow increased to values slightly above 100 per cent of control. The maximum was reached at temperatures between 32° and 28°C. During progressive hypothermia, filtration rate and renal plasma flow decrease as approximately linear functions of rectal temperature. Filtration fraction is variably increased during hypothermia. The extraction ratio of P-aminohippuric acid is unaffected by changes in temperature to 27°C. The maximal rate of tubular excretion of P-aminohippuric acid is increased during shivering and then decreased as temperature falls. Dogs subjected to repeated experiments exhibited no evidence of residual change in renal function resulting from hypothermia. Parallel studies have been reported by Morris *et al.* (1954) who studied changes in renal hemodynamics during hypothermia following clamping of the thoracic aorta.

Normally the kidneys exercise a careful control over potassium in the blood. Under circumstances of marked shivering a hyperpotassemia can result. In all studies where hypothermia was performed with unanesthetized animals, including dogs, ventricular fibrillation rarely was the cause of death. In the experiments done by Ariel, Bishop and Warren (1943), Crimson (1944), Dill and Forbes (1941), and Hamilton, Dresbach and Hamilton (1937), while not always specifically mentioned, it can be assumed that shivering accompanied the heat loss and, therefore, it can be assumed that an increase in serum potassium was present. This might possibly have been a fortuitous prophylaxis. In the use of hypothermia to facilitate cardiac surgery, most workers have controlled completely the shivering reflex. In this group, ventricular fibrillation is quite common. Maguire and Merendino (1955) have suggested that if the temperature is reduced sufficiently, normal calcium levels in the presence of hypopotassemia resulting from absence of shivering is possibly the chemical stimulus precipitating ventricular fibrillation in the hypothermic dog. They also suggest that during cooling the conducting system may be interrupted at a higher temperature level than the contractile mechanism of the myocardium. Since potassium is intimately concerned with the conduction processes of the myocardium, these changes are even more significant.

The excessive release and subsequent flooding of the heart by endogenous epinephrine has been postulated by Cookson, Neptune and Bailey (1952) and Berne (1954) to be another cause of the increased irritability of the heart. This concept has been studied by Hegnauer and he has presented evidence to indicate that an excessive release of epinephrine probably does not occur. Grumbach, Howard and Merrill (1952), however, in their studies with the perfused rabbit heart suggest that calcium initiates spontaneous ventricular fibrillation by stimulating adrenergic receptors in the myocardial tissue to release epinephrine. Changes in circulating epinephrine have been reported by some investigators. Wada, Seo and Abe (1935) using a biological quantitative assay method reported a marked increase in blood epinephrine at temperatures below 30°C. Itikawa (1935) carried out similar experiments with dogs in which medullary tissues was removed and found no increase in blood epinephrine when compared to control animals. Satow (1936) reported on a series of epinephrine replacement studies following removal of the suprarenal medulla and was able to prevent the exaggerated temperature fall, blood pressure fall and bradycardia of the control animals. In all these experiments, however, the dogs were placed in the ice bath in a conscious condition. Under these circumstances cold narcosis occurred at temperatures below 30°C. Prior to reaching a state of unconsciousness, the animals obviously shivered markedly. This in itself would account for a

large portion of the blood epinephrine increase that was observed.

More recent studies have been made on this problem with varying degrees of success. Fisher, Fisher and Fedor (1955) have reported that hypothermia produced no change in the norepinephrine and total chromaffin reaction of the adrenal medulla of rats.. On the other hand, Egdahl, Nelson and Hume (1955) have reported decreased adrenal cortical function during hypothermia. Recent studies by Brown, Cotten and Walton using a fluorometric technique of blood analysis have shown that there is a moderate increase in adrenal medullary secretion of epinephrine and norepinephrine during hypothermia in the dog. Why the production of the so-called stress hormones of the cortex should be reduced while those of the medulla should be increased or remain unchanged is not known.

There are constant and distinct changes in the electrocardiogram in cooled dogs. Electrocardiograms which have been taken in surgical patients who have been subjected to hypothermia have been similar to those seen in the dog, rat and rabbit. Hamilton, Dresbach and Hamilton (1937), Crimson (1944), Hook and Stormont (1941), Prec *et al.* (1949), Bigelow, Lindsay and Greenwood (1950), Siems *et al.* (1955), Nardone, Wilber and Musacchea (1955), and Hicks, McCord and Blount (1956) have observed the following changes during cooling. The rate slows and sinus rhythms with rates of 15 to 30 per minute are usual findings at 20°C. The PR interval is roughly twice the PR interval at 37°C. The duration of the QRS is often difficult to define below 25°C. Usually it is about doubled at 20°C. and the QT interval is three times to four times as long as at 37°C. The shape of the T wave changes with cooling and is also often difficult to define. It is nearly always a negative wave at 20°C., but it may become inverted at any stage of the cooling. Bigelow *et al.* (1950) consider that the earlier an inversion appears, the poorer is the prognosis for an uneventful recovery.

The Pr and Qt distances increase much more rapidly with a falling body temperature once 30°C. is passed. As cooling continues, the rhythm changes at some point, usually below 20°C., but variation can appear at higher temperatures. The type of change is unpredictable. The most common sequence of events is the appearance of ventricular ectopic beats followed by ventricular fibrillation and death. There is usually little warning. With virogous ventricular fibrillation it is impossible to identify P waves. Bigelow, Lindsay and Greenwood (1950) have shown that on observation of the heart there is a continuance of regular auricular beats for a period of up to twenty minutes after the onset of fibrillation. These become irregular, and eventually both auricle and ventricle come to cardiac arrest in diastole. Occasionally, instead of fibrillation, a pacemaker in or below the AV node will take over, resulting in the appearance in the electrocardiogram of nodal rhythm, or of a slow idioventricular rhythm.

If the animal is rewarmed, the changes in the electrocardiogram revert toward normal. The heart rate, the PR interval, the duration of the QRS complex and the QT interval usually return to normal, but the T wave and the ST segments may be of different form than those before cooling.

Attempts have been made to use the electrocardiogram pattern and changes in the pattern to forecast pending arrhythmias, and even the onset of ventricular fibrillation. Some investigators, notably Osborn (1953) and more recently Covino and Charleson (1955), Covino and Williams (1955) and Covino and Hegnauer (1955) have presented data indicating that a current of injury demarkation in the electrocardiogram is indicative of approaching danger. The results of these investigators are very interesting and important, although other investigators have not been able to detect any significant changes in the electrocardiogram pattern indicating pending fibrillation. Covino and Hegnauer (1955) have related a lower pH of acidosis secondary to respiratory changes which alters the excitability curve of the ventricle. A maintenance of a near normal pH during cooling prevented ventricular fibrillation and changes in the excitability curves.

Hegnauer and Penrod (1950) in their

studies presented information which led them to believe that increases in blood viscosity might contribute to the onset of fibrillation. In these studies they noted an increase in both viscosity and hematocrit readings, the viscosity increase being greater in those cases where the hemaocrit readings increased. Since that time several other investigators have also observed increases in hematocrit readings, but little attention has been paid to the possible importance of increased viscosity. Page (1955) has indicated that increased viscosity may be partly responsible for the observed decrease in renal blood flow during deep hypothermia. McMillan *et al.* (1955) have recently suggested that further studies of the significance of viscosity should be conducted, particularly with reference to changes in cardiovascular function during hypothermia.

The effect of hypothermia on myocardial function has been studied rather extensively by Berne (1953) and Edwards *et al.* (1954) and more recently by Reissmann and Kapoor (1956). Edwards has confirmed the work of Penrod that coronary A-V oxygen difference is essentially unchanged during hypothermia. However, due to the decline in coronary blood flow, myocardial oxygen consumption significantly decreases during hypothermia. Since he found that there was a disproportionate fall in left ventricular work as determined by stroke volume, he concluded that the mechanical efficiency of the left ventricular muscle was considerably reduced at the lowered temperatures.

Bing *et al.* (1949) have demonstrated a fall in myocardial efficiency in the human heart *in vivo*. In low output failure, though, the myocardial oxygen usage per unit of ventricular weight is normal, and the decrease in efficiency is primarily the result of a diminution in cardiac work. In hypothermia, Edwards *et al.* (1954) feel that there is a decline in both cardiac work and myocardial aerobic energy uptake. The fall in mechanical efficiency of the heart in both low output failure and hypothermia suggest a partial loss of the ability of the heart to convert aerobic energy into useful work.

Edwards has also demonstrated that although the decline in left ventricular oxygen consumption during hypothermia is considerable, the fall in oxygen usage of the whole animal is proportionally even greater. As a result, the ratio of oxygen consumption of the heart to the total body oxygen consumption increases during hypothermia. This would indicate that the heart maintains a relatively high oxygen consumption as compared to the rest of the body.

A recent article by Wiggers (1954), however, has cast doubt as to the validity not only of Edwards' work, but also of all studies of left ventricular metabolism. The basis of all studies involving metabolism of the heart and especially the left ventricular muscle has been based on the assumption by Gregg and Shipley (1947) that the coronary sinus receives venous blood only from the left ventricle. Geller, Brandfonbrener and Wiggers (1953) and Johnson and Wiggers (1937) have shown rather conclusively that the coronary sinus not only drains the left ventricle, but in fact receives a sizable (although variable) quantity of blood from the right ventricle by way of the thebesian veins. The significance of this fact is obvious, for it invalidates all studies of left ventricular metabolism based on coronary sinus flow. It should also be evident that the myocardial efficiency as determined by Edwards may not decrease as his studies point out, but may stay the same or even increase in the face of reduced temperature and reduced stroke volume.

Sabiston, Theilen and Gregg (1955) have shown a decrease in cardiac output, oxygen consumption, mean arterial pressure, heart rate and venous pressure. At the same time there was a reduction in the circumflex coronary flow although the percentage reduction in cardiac output was greater. On this basis, coronary flow fraction is actually increased at temperatures of 25° to 26°C. They observed that at these temperatures the coronary vessels dilate whereas the remaining vessels of the body constrict. There is a general increase in peripheral resistance while there is a reduction or no change in coronary resistance. In any event, neither change is believed to influence the other. Shumway, Gliedman and Lewis

(1955) have carried out coronary perfusion experiments during long periods of cardiac occlusion under hypothermia with rather satisfactory results.

The work of Berne (1953) has demonstrated that the decline in arterial pressure in severe hypothermia is not a manifestation of myocardial failure. He found that good pressure contours from the aorta, left ventricle and left auricle were maintained even with extreme degrees of cooling, and that the contours did not show any of the characteristics of myocardial failure during hypothermia. The striking changes induced by hypothermia were the marked prolongation of systole and of isometric relaxation. The prolongation of the isometric relaxation phase or diastole in itself does not interfere with ventricular filling, since the heart rate is extremely slow during hypothermia. If, however, the rate is moderately increased by artificial stimulation, Berne found that the extended period of isometric relaxation assumed major importance, as total diastole is reduced to a greater extent than is isometric relaxation. In this manner ventricular filling-time is shortened and atrial contraction does not contribute to ventricular filling, since atrial systole occurs while the A-V valves are still closed.

Trautwein and Dudel (1954) have studied the action potential and mechanograms of the cat papillary muscle as a function of temperature. They found that as the temperature decreased from 35° to 25°C. the papillary muscle showed an increase in the amplitude of the mechanogram. This increase was believed to be an inherent part of the muscle dynamics and was always present, even when the preparation was driven over a wide range of frequencies. Garb and Schriabine (1955) have recently shown that with the isolated cat papillary muscle preparation there was greater utilization of glucose at 27°C. than at 37°C. This greater glucose utilization was recognized as an increase in the contractile force of the substrate-depleted papillary muscle at 27°C.

Wynn (1954) has shown that in the intact dog and in man, exogenous glucose in the form of 5 per cent intravenous glucose is metabolized very slowly. Their studies indicate the infusion of glucose during hypothermia should be reduced from 5 per cent to at least 2.5 per cent, and that these changes in glucose metabolism with hyperglycemia alter the plasma-Na and plasma-total protein levels so that both values will fall.

Investigations of the influence of hypothermia on the heart contractile force of experimental animals have been carried out by Brown and Cotten (1954 and 1956). One of the most significant aspects of their study was the observation of a transient increase in the force of myocardial contraction as the animal was cooled. The increase reached a maximum value of approximately 25 percent above normothermic contractile force values at temperatures of 28° to 30°C., and thereafter gradually decreased in such a manner that control values were obtained at temperatures of 22° to 24°C. Similar results were observed in both intact animals and in isolated preparations. The nature of this increase has been studied rather extensively and appears to be due to a combination of factors.

It appears that the primary cause is a temperature coefficient of the contractile process of cardiac muscle such that maximum efficiency or maximum developed tension can be achieved at temperatures below the normal environmental temperatures of the organism. This property also appears to be characteristic of other muscle types besides cardiac muscle. Changes in initial diastolic length do not occur during the primary stage of hypothermia hence the increase in contractile force is not achieved by means of Starling's Law of the heart. There is a significant increase in the viscosity of blood and plasma, but these changes occur at temperatures much lower than the changes in contractile force. It was found, however, that during the initial stages of cooling, the plasma level of circulating catachol amines was increased slightly. This increase was of such a magnitude as to partially account for the increase in contractile force on the intact animal. There is reason to believe that the catachol amines measured were specifically epinephrine and norepinephrine and that both were present in increased amounts due to an increase in the output by the adrenal medulla.

The increased activity of the adrenal medulla during hypothermia is not altered following total chemical sympathectomy.

It would appear, therefore, that during hypothermia the total developed tension of cardiac muscle can and does increase. This increase is due in part to a temperature coefficient of the contractile process of the muscle itself and also to changes in circulating catachol amines, probably epinephrine and norepinephrine. It does not appear to be due to Starling's Law of the heart or to increases in blood viscosity.

Selman and Brofman (1955) in studying the effect of coronary occlusion in hypothermic dogs, reported that the mortality rate in the hypothermic animal was 100 per cent as compared to 50 per cent in control normothermic animals. Stephens, DeRiemer and Wexler (1955) have studied the use of an artificial pacemaker during hypothermia and have found that if the rate is reduced proportionately, dogs can be maintained down to temperatures of 12°C. Berne (1954) has shown that during artificial acceleration of the cooled heart, coronary blood flow may be reduced as a result of the proportionately long period of extravascular compression, and will indirectly precipitate venticular fibrillation. Wiggers (1954) has presented evidence which indicates that the major contributing factor to coronary flow is ventricular contraction or compression. This will obviously need further investigation since the basic concept is in conflict with the presently accepted theories on the role of ventricular compression in coronary flow.

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A	Anesthesiology
ACN	Acta chir. neerl.
AFTR	Air Force Technical Report
AHJ	Am. Heart J.
AIM	Ann. Int. Med.
AIPT	Arch. internat. pharmacodyn.
AJP	Am. J. Physiol.
AJCP	Am. J. Clin. Path.
AMAAIM	A.M.A. Arch. Int. Med.
AMAAS	A.M.A. Arch. Surg.
AMS	Acta med. scandinav.
APS	Acta physiol. scandinav.
ACRS	Ann. Roy. Coll. Surgeons England
AS	Ann. Surg.
BMJ	Brit. M. J.
BJA	Brit. J. Anaesth.
C	Circulation
CAR	Cancer Res.
CR	Circulation Res.
CRAA	Anesth. & Analg.
E	Endocrinology
ECN	Electroencephalog. & Clin. Neurophy.
FP	Fed. Proc.
GHR	Guy's Hosp. Rep.
JAM	J. Aviation Med.
JAMA	J.A.M.A.
JAP	J. Appl. Physiol.
JCI	J. Clin. Invest.
JICS	J. Internat. Coll. Surgeons
JP	J. Physiol.
JPET	J. Pharmacol. & Exper. Therap.
JTS	J. Thoracic Surg.
L	Lancet
LM	Laval med.
NEJM	New England J. Med.
NYJM	New York J. Med.
PA	Pfluger's Arch. ges. Physiol.
PM	Presse med.
POM	Postgrad. M. J.
PR	Physiol. Rev.
PRS	Proc. Roy. Soc., London, s.B.
PRSM	Proc. Roy. Soc. Med.
PSEBM	Proc. Soc. Exper. Biol. & Med.
S	Science
SAMJ	South African M. J.
SF	Surg. Forums
SU	Surgery
SGO	Surg., Gynec., & Obst.
TJEM	Tohoku J. Exper. Med.
YJBM	Yale J. Biol. & Med.

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This paper presents two pediatric patients who had uncontrolled diabetes on admission to Duke Hospital and who subsequently developed large areas of palatal slough secondary to infection with the primitive class of fungi of the family of mucoraceae. These fungi are constant contaminants of the soil, fruits and the nornal body surface but in the presence of uncontrolled diabetes mellitus these ordinarily harmless fungi become extremely pathogenic.

The first case is of a 14 year old colored female who was admitted in severe diabetic acidosis. Examination revealed a fungating mass on the hard palate which by culture and biopsy revealed the presence of Rhizopus oryzae. Treatment with antibiotics and desensitization of the patient to the fungi produced eventual healing with a large defect in the palate at the site of the original lesion.

The second patient was a 16 month old white male infant who was admitted for repair of a palatal cleft which, by history, resulted from a fungus infection. This infant, likewise, had diabetes mellitus.

Complement-Fixation Titres in Tertiary Lymphogranuloma Venereum — A Study of Results After Treatment with Broad-Spectrum Antibiotics by Julius Goldberg and Leon Banov, Jr. (Charleston) Brit. J. Ven. Dis. 32:37-39, 1956.

Fourteen patients with tertiary lymphogranuloma venereum (rectal involvement with subsequent formation of rectal strictures) were treated with one of the following antibiotics: chlortetracycline, chloramphenicol, oxytetracycline, and erythromycin. The patients were followed for periods of 12 to 27 months and the complement-fixation titers of their sera were determined. Of the 14 patients, 12 still had circulating antibiotics to a significant titer, some as long as 27 months after apparently satisfactory clinical antibiotic treatment. Only 2 patients showed no complement-fixation antibiotics after therapy.

These laboratory results indicate that the amount of antibiotic necessary to improve the clinical manifestations of lymphogranuloma venereum is usually not sufficient to stop antibody formation against the virus particles even after 2 years. This may suggest that active virus particles are still present after successful clinical therapy and may partially explain the large number of supposed re-infections observed in this disease.

MEDICAL COLLEGE CLINICS

THE MEDICAL COLLEGE OF SOUTH CAROLINA

ELECTROCARDIOGRAM OF THE MONTH

MITRAL STENOSIS

DALE GROOM, M. D.
Charleston, S. C.

Case Record—A 31 year old mother of two was referred to the Beaufort Heart Clinic in March 1955 because of progressive dyspnea. She acknowledged having been hospitalized on three occasions for rheumatic fever during adolescence, but had noted no cardiac symptoms until about the age of twenty-five. Since then her exercise tolerance had decreased to the degree that she was unable to walk half a block or to carry on ordinary household duties without considerable dyspnea and fatigability. Of late some ankle edema had been noted.

Auscultatory examination revealed a long blowing diastolic murmur and a short pre-systolic rumble both localized to the mitral area. No systolic or other murmurs could be heard. The pulmonic second sound was accentuated and there were moist rales audible at the lung bases posteriorly.

By cardiac fluoroscopy there was seen to be selective enlargement of the left atrium and the right ventricle, with prominent pulsation in the pulmonary artery. On chest roentgenograms the overall heart size was not remarkable, and the small septal "lines B of Kerley", indicative of pulmonary venous hypertension,[1] were clearly demonstrable in the costophrenic angles.

When five months later the patient consented to cardiac surgery because of increasing disability, a mitral commissurotomy was performed through an incision in the left auricular appendage. The mitral valve was found to be fibrotic, almost completely closed, with the valve orifice estimated by palpation to be no more than about 4 mm. in diameter. Some regurgitant flow could be felt in systole. Pressure recordings made from the left atrium during surgery showed a fall from about 20 to 10 mm. of mercury following incision of the medial and lateral valve commissures.

The patient made a satisfactory recovery following surgery. When examined one year later she had no evidence of cardiac disability and was able to carry on a normal amount of activity without symptoms.

The electrocardiogram below was recorded preoperatively.

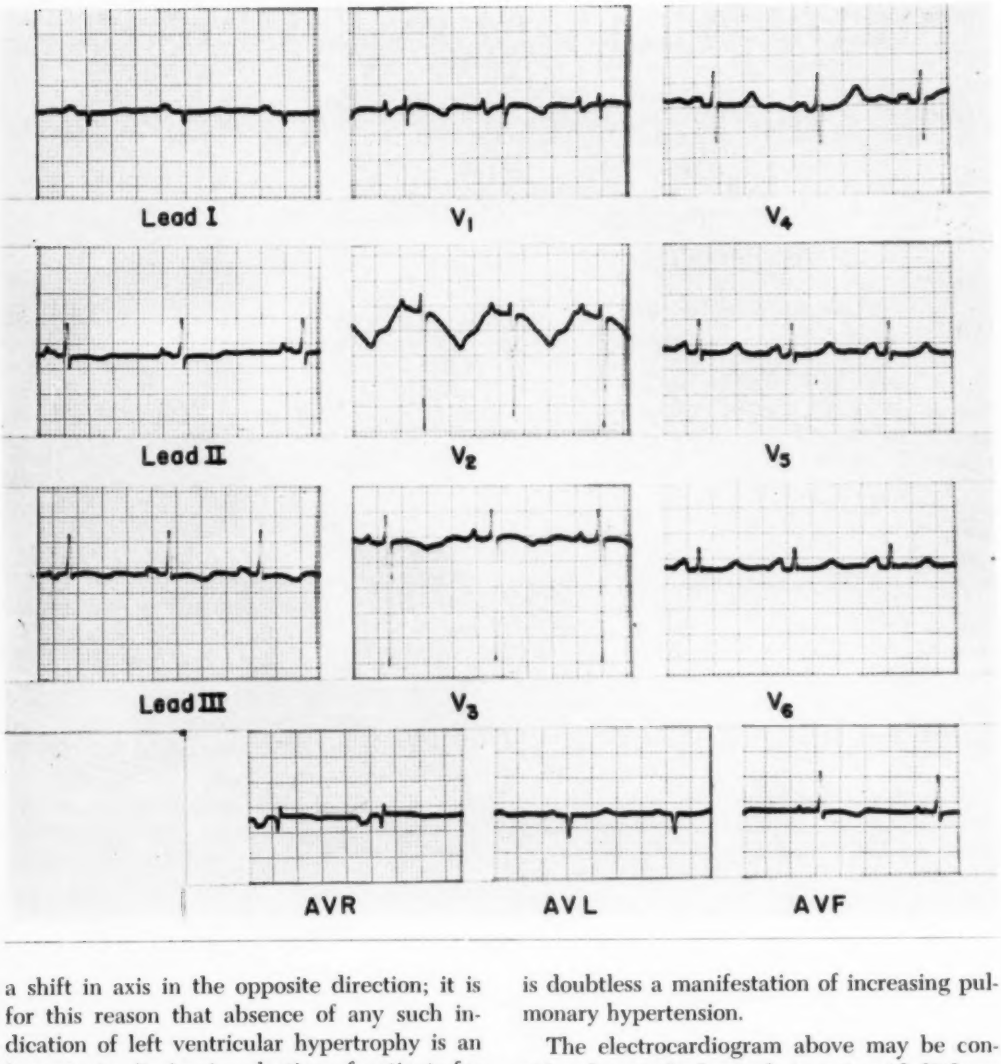
From the Department of Medicine.

Electrocardiogram—The most striking feature of this tracing is the right axis deviation. QRS complexes are totally negative in lead I and positive in lead III, and of decreasing amplitude as the precordial electrode is advanced across the left chest wall. So far as the QRS complexes are concerned this electrocardiogram is not unlike those recorded from cases of dextrocardia. The P waves are prominent throughout, being unusually broad and notched in some leads. T waves are abnormally inverted in leads II, III and aVf, and in leads from the right side of the precordium.

Discussion—The advent of mitral valve surgery in recent years has brought with it a need for more accurate diagnosis of mitral stenosis. Of particular interest in selection of patients for commissurotomy is the evaluation of the relative degree of stenosis and insufficiency of the mitral valve. Although the electrocardiogram is in no way specific for mitral stenosis or any other valve lesion it often provides indirect evidence of value in establishing this diagnosis.

Obstruction to blood flow at the mitral valve produces an increased back pressure in the left atrium as measured in this case, with resultant enlargement of the left atrium. The broad, flat, notched P waves in one or more of the standard leads are frequently associated with this abnormality, in contradistinction to the tall pointed P waves which develop with selective enlargement of the right atrium as in pulmonary stenosis.

Reflected back through the pulmonary circulation, the increased pressure produced by stenosis at the mitral valve imposes an undue load on the right ventricle with consequent hypertrophy of the right side of the heart. Because of this, and because the work of the left ventricle may be actually decreased in pure mitral stenosis, the mean electrical axis of the electrocardiogram become shifted toward the right. Evidence of right ventricular hypertrophy may appear or, as in this case, only right ventricular preponderance. Mitral regurgitation, on the other hand, gives rise to



a shift in axis in the opposite direction; it is for this reason that absence of any such indication of left ventricular hypertrophy is an important criterion in selection of patients for mitral commissurotomy.

During the five month period in which this patient deferred surgery the T waves which were formerly upright in V-2 and V-3 became inverted. This inversion of T waves over the right ventricular leads is commonly seen in "right ventricular strain". Its appearance here is doubtless a manifestation of increasing pulmonary hypertension.

The electrocardiogram above may be considered typical of mitral stenosis with little or no mitral insufficiency. Other signs of rheumatic heart disease may of course also be present, notably prolongation of the P-R interval or atrial fibrillation.

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INTERSTITIAL PREGNANCY
A CASE REPORT

LAWRENCE L. HESTER, JR., M. D. AND
JULIAN A. SALLEY, M. D.

This 21 year old gravida 3, para 2, abortion 1, presented herself to Roper Hospital's emergency room on June 14, 1956 with the chief complaint of lower abdominal pain. Five hours prior to admission the patient had sudden onset of sharp mid-lower abdominal pain, rapidly spreading over the entire abdomen. Since the onset of the pain, she had become progressively weak with dizziness and fainting. She also had pain on deep inspiration at the costal margin as well as some shoulder pain. Her last menstrual period had been in February, 1956. She had developed symptoms of pregnancy during the period of amenorrhea. Menstrual periods had been regular every 30 days until the present episode of amenorrhea. Her last pregnancy terminated in an uncomplicated spontaneous delivery one year ago.

Physical examination on admission revealed a pale, colored female in mild distress. She was slightly lethargic and complaining of weakness. Her blood pressure was 70/50 and pulse 80 per minute. Skin was warm, dry and pale. The lungs were clear to percussion and ausculation. The heart was not enlarged and a normal sinus rhythm was present. The abdomen was slightly distended, with tenderness in both lower quadrants and to a lesser extent in the upper quadrants. There was little rebound tenderness and no muscle spasm or localized tenderness. Pelvic examination revealed normal external genitalia. The cervix was slightly blue. The uterus was indefinitive and difficult to outline, but it was thought to be twice normal size and tender. No adnexal masses were palpable. The culdesac was full and tender with fluctuation suggesting free peritoneal fluid. A needle aspiration of the culdesac was performed and 10 ml. of blood was obtained which did not clot. Laboratory examination on admission revealed a hemoglobin of 9.5 grams. The white blood count was 15,000 with 85% polys and 15% lymphs, and the volume of packed cells 26 volumes %. The patient was immediately transfused with 1000 ml. of whole blood and a laparotomy was performed with a preoperative diagnosis of ruptured tubal pregnancy. Upon opening the peritoneal cavity, approximately 1500 ml. of old blood was found free in the abdomen. The uterus was twice normal size with a 14 weeks pregnancy with intact membranes attached to the right cornu. At this point the uterus had ruptured, leaving fetus and membranes free in the peritoneal cavity except for a small placental attachment to the myometrium. The left tube was occluded by chronic inflammatory disease. The right tube was normal in its distal portion. Because the non-patency of the uninvolved tube prohibited future child bearing, a total hysterectomy was performed. It was felt also that simple excision of the involved myometrium would produce rather massive hemorrhage due to the friable tissue adjacent to the placental implantation.

The pathological report was that of uterus of pregnancy (interstitial) ruptured, and cervicitis, chronic. The gross description was as follows: "Received an intact, previously in-

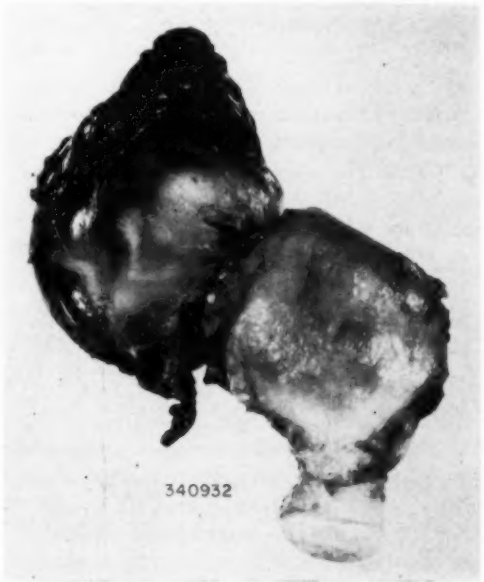


Figure 1.—Fetus intact Amniotic sac, and uterus.

Department of Obstetrics and Gynecology, Medical College Hospital and Roper Hospital, Charleston, South Carolina.

cised, corpus uteri with cervix. The myometrium is not unusual. The endometrial cavity contains a placenta. Extending from the cornual region is remainder of the placenta with large blood clot, amniotic sac and a 5 cm. crown to rump fetus, within the intact amniotic sac. (See Fig. I and II). The cornual region

Figure 2.—Uterus opened showing interstitial rupture.

represents hemorrhage extending into the myometrium and apparently represents rupture at this point. The microscopic description confirms a diagnosis of an interstitial pregnancy with rupture."

The patient withstood the operative procedure well and was returned to the ward in good condition. Her postoperative course was essentially uncomplicated and she was discharged on the seventh postoperative day improved.

Discussion: Interstitial pregnancy is a rare form in which the pregnancy occurs in the portion of the Fallopian tube that traverses the uterine wall. The incidence of interstitial pregnancy in series of ectopic pregnancies has been various reported from 1.2 to 1.7 percent. By astute observation and careful examination, the diagnosis of interstitial pregnancy may be made before rupture has occurred. (1) This form of ectopic pregnancy is the most dangerous of all types from the point of view of hemorrhage. This is due to the proximity of the large vessels of the uterus and the fact that its location in the musculature permits a longer period of viability and growth before rupture and resulting hemorrhage occur. The rupture may occur into the uterine cavity with passage of fetus and placenta per vagina; however, the rupture is more likely to occur into the abdominal cavity.

This case represents the usual case in that rupture occurred later than with the usual tubal pregnancy. Blood loss was rather massive and she was in shock at the time of her admission to the hospital. She received 1000 ml. of whole blood prior to operation and 1000 ml. during the operation. A total abdominal hysterectomy was done because the left Fallopian tube was occluded by pelvic inflammatory disease and it was thought at that time that blood loss would be less by removing the uterus than to resect the ruptured portion.

Summary

A case of interstitial pregnancy with rupture into the abdominal cavity is presented. A total abdominal hysterectomy was performed.

REFERENCE

(1) Cochran, Robert B. Interstitial Pregnancy, Obs. and Gyn. 4:514, 1954.

PATHOLOGICAL CONFERENCE

H. R. Pratt-Thomas

History: 13 year old colored girl admitted to the pediatric ward on July 20, 1955. Grandmother stated that child had onset of headache, abdominal discomfort and fever one week prior to admission. Three days before admission she began vomiting and thenceforth she became progressively weaker. She was constipated until July 19 when she had a loose stool, and subsequent stools have also been loose but otherwise normal in all respects. She was taken to a physician in Mullins, S. C. on July 19th and he thought she had some weakness of deglutition. He performed lumbar puncture which yielded clear fluid containing 40 cells. Therefore she was referred here for further study.

Past history did not provide any additional significant information.

On admission she had a rectal temperature of 107°F., pulse 160, respirations 44 and a systolic blood pressure of 70. She was well developed and well nourished, but acutely ill and quite lethargic. Her skin was hot, but of good turgor and without rash. Her neck was stiff, but neither Brudzinski's nor Kernig's sign was present. She had hyperactive tendon reflexes and an absence of abdominal reflexes. No cardiac abnormalities were detected.

In the hospital she was at first able to take carbonated fluids well, swallowing without difficulty. A spinal tap yielded clear fluid. Intravenous fluids containing sulfasoxazole (Gantrisin), glucose and balanced electrolytes started. Oxytetracycline (Terramycin) 100 mg. intramuscularly every 6 hours was ordered. Vigorous ice water and alcohol sponges kept temperature in the vicinity of 104° during the first night.

The next day she was weak and toxic, but conscious, oriented and cooperative. Complete neurological examination failed to reveal any specific spinal nerve paralysis or weakness. Neck stiffness was less, if changed at all. At about noon she began to have respiratory difficulty. At 1:00 P. M. blood pressure was 60/0 and the skin was cold and clammy. While the staff was locating intravenous equipment and oxygen, her blood pressure became unobtainable. Venesection was performed and caffeine sodium benzoate was given by intravenous drip. Respiration and color improved. Blood pressure rose to 60/55. Oxygen by nasal catheter was continued. Coffee-ground material was vomited. Respiration continued to be fast and shallow. At 4:15 P. M. the skin became very cyanotic and cold. Blood pressure was again unobtainable. Breathing became labored, and ceased altogether at about 4:30 P. M. The patient was placed in an iron lung. There was fairly good heart beat until the pulse was unobtainable at 10:45 P. M. She was pronounced dead at 10:50 P. M.

Laboratory Data: (July 20) Hgb 12.5, RBC 4.6, WBC 9,200 (L 12, M 2, PMN 86, NF 6) VCP 44%. Urinalysis: Cloudy yellow, acid, Alb +++, Sug & Acet O, WBC 2-5, RBC 3-4, epith. ++, casts ++++ coarse granular. Stool: Negative. Spinal Fluid: Cell count 30/cu. mm., 28% PMN sugar 52 mg. per 100 ml. Chlorides 630 mg. Protein 17 mg. Smear and culture of spinal fluid negative.

Bacterial Agglutinations: *Sal. typhosa "H"*, *Sal. typhosa "O"* and *Sal. paratyphi* (A) were negative. *Sal Shottmuelleri* (*B*) was 2 plus in a dilution of 1/20. *Sal. cholarae suis* (*C*) was 1 plus in a dilution of 1/20. *Proteus OX 19* was four plus in a dilution up to 1/40 and one plus in a dilution up to 1/320. *Brucella abortus* was negative.

Blood drawn July 20, and July 21, was sent to Federal Laboratory in Montgomery, Alabama for complement fixation tests. These tests were reported negative for any known specific antigen.

Dr. Jack Paul (*conducting*): Mr. Davenport, please initiate the discussion of this interesting case.

Senior Student Davenport: We have for consideration a girl whose illness in the beginning was characterized by headache, abdominal discomfort, weakness, vomiting and looseness of stools. Some questionable weakness in swallowing followed and a pleocytosis which was confirmed in our laboratory. Bulbar poliomyelitis would be my first consideration. There is no elevation of the serum proteins such as is often the case in poliomyelitis. There are two clinical features which are also against it. The completely negative neuro-

logical examination stands out, particularly if cranial nerve palsies are also excluded. Furthermore the circulatory manifestations of poliomyelitis are frequently of hypertensive nature and if hypertension does occur it is, at least temporarily, alleviated by supportive fluids which was not true here.

My next consideration would be one of the rickettsial diseases, typhus, either epidemic or endemic type, and Rocky Mountain spotted fever. None of the agglutination series is of significance except possibly the *proteus X-19* which might be elevated in any of the three. The significance of the *proteus X-19* agglutination is also subject to question because of the report from the Federal Laboratory that the blood was negative for any known antigen. Perhaps the blood spoiled en route. It is also possible that in a fulminating infection there would be no antibody response. Least likely of all is the possibility that the patient was also suffering from agammaglobulinemia. Aseptic serous meningitis is suggested by the prodromal symptoms, except that usually they are more respiratory in nature. The spinal fluid is not at all helpful in supporting this diagnosis and there appears to have been too great a degree of systemic intoxication and shock for this disease.

I would expect the various typhus fevers and Rocky Mountain spotted fever to all have a rash, but it might have been overlooked in this colored child. Leptospirosis might be considered, but it does not appear likely that Weil's disease of this severity would occur without more evidence of either hepatic or renal damage.

One of the viral encephalitides ought to be considered, particularly as the hyperthermia suggests a lesion of the midbrain, but the mental clarity is against this.

There is no indication of one of the purulent meningitides and torula or cryptococcus is certainly more subacute or actually chronic in nature.

I believe that either endemic typhus or bulbar poliomyelitis would be my first choices.

Dr. Paul: Mr. Harper, do you have any additional ideas?

Mr. Harper: I felt that the patient had either one of the rickettsial diseases or a proteus infection. The latter might involve either the urinary or digestive system. There is no definite proof that she had actual diarrhea as the history is vague and she does not seem to have had tenesmus or any loss of skin turgor.

Dr. Paul: Mr. Harper, what group of diseases produce the most severe toxemia and high fever in children of this area during the summer?

Mr. Harper: I would say that intestinal infections with salmonella and the shigella group are chiefly responsible. I don't believe that we have sufficient evidence for any of these in this case.

Dr. Kelly McKee: It is difficult to make an ante-mortem diagnosis. The peripheral vascular collapse points to a meningococcal infection, but the course is somewhat prolonged and there is no skin rash. I also considered heat stroke. I am not sure of the significance of positive titers above 1:40 on one occasion. I don't think it would be very significant. It is too early for the complement-fixation tests to be helpful.

Dr. Ben Boltjes: Sera are quite stable and I would not think that anything could happen that would invalidate the test. Complement-fixation titers usually do not become positive until the tenth or fourteenth day whereas agglutination tests become positive earlier, often by the sixth or seventh day. There is a strong possibility that this could be endemic typhus as the case is in that interval between which agglutination and complement-fixation tests become positive. One positive reading in a 1:340 dilution with *proteus OX-19* is not within itself significant. You should demonstrate a rise for it to be of diagnostic importance. Constipation is the rule in endemic typhus. The persistent low blood pressure is very fitting. Ten per cent of patients do not have a rash and it might be evanescent and particularly difficult to see in a colored individual. Perhaps the weakness of deglutition was due to the discomfort of a related parotitis which these patients often have.

Dr. Pratt-Thomas: *FINAL PATHOLOGICAL DIAGNOSIS*:
VASCULITIS, ACUTE, WITH MURAL

THROMBOSIS (RICKETTSIAL DISEASE, MOST PROBABLY TYPHUS).

The pathologic findings in this case are very minimal, as might be expected in what I believe to be typhus fever. Grossly, there was nothing other than cerebral edema and a minor degree of focal pulmonary atelectasis with an associated broncho-pneumonia. Microscopically there is an interesting type of vascular lesion which is most conspicuous in pulmonary veins and arteries. This consists of focal endothelial cell swelling with superimposition of a minature thrombus on the endothelial plaque (Figure 1). In other instances swollen and proliferating endothelial cells are more haphazardly mixed with leukocytes so as to form a fan-like excresence (Figure 2). The other histologic variation consists of a mural thrombus attached to the vessel wall at a point where there is edema and degenerative changes in the collagenous component of the vessel wall (Figure 3). Bodies of some sort occupy the swollen endothelial cells. I have always found it extremely difficult to identify positively rickettsia in tissue sections. There is a mild bronchopneumonia present which appears to be of secondary bacterial origin and there are bacteria demonstrable by special stains. How many of the bodies in the endothelial cells are bacteria and how many are rickettsia I cannot say. It appears likely that at least some are rickettsia as this rather striking vascular lesion is not usually produced by the ordinary secondary bacterial pneumonias. There was edema of the brain, but none of the so-called typhus nodules could be found. There was a mild, early interstitial myocarditis and reticuloendothelial hyperplasia of the lymph nodes, spleen and lymphoid apparatus of the intestine.

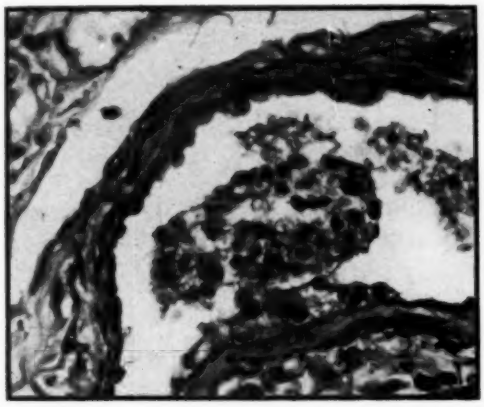


Figure 1.—Swollen endothelial cells surmounted by a minature thrombus in a pulmonary vessel. Hema toxylin and eosin X 700.

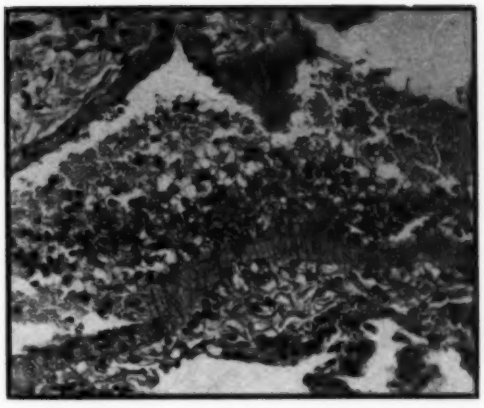


Figure 2.—Mixture of swollen endothelial cells mixed with leukocytes radiating out from the vessel wall. Hematoxylin and eosin X 350.

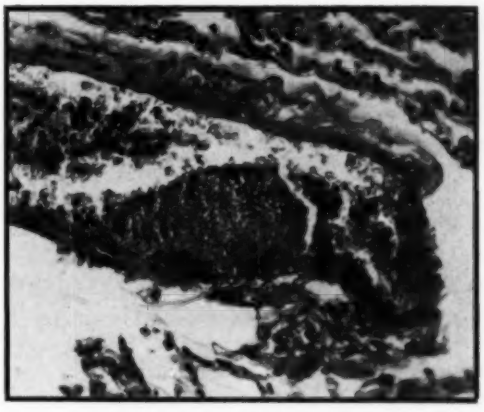


Figure 3.—Localized mural thrombosis of blood vessel. There is degenerative change in the vascular wall which cannot be visualized in this photograph. Hematoxylin and eosin X 350.

PRESIDENT'S PAGE

MEDICAL COLLEGE HOSPITAL

In South Carolina, as in many other states, medicine is organized and distributed on a state basis. The state medical association is composed of the various county societies. It is the medical organization recognized officially by the state and federal governments in policy-making and allocation of funds. Indigent patients are cared for upon a county level. Federal and state agency supported cases are cared for upon a state level. Only in exceptional instances does medical care for these cases extend beyond the border of the state. Blue Cross and Blue Shield function within the state, though there is a close affiliaion between similar programs in other states. Private patients in general are cared for within the state, though there are a number of exceptions in which they are referred to medical centers beyond its borders.

With medicine thus organized it is important that there be reasonably complete medical service within the state. Excellent facilities are available in a number of community hospitals, but these are of necessity limited by economic and other reasons. It is to supply services not available in community hospitals that is one of the chief purposes of the Medical College Hospital. It is now in operation and well staffed in the various departments. It should be supported by the medical profession so that its sphere of usefulness will steadily increase. A close association should develop between the Medical College and the practicing profession. The Medical College Hospital can be considered the capstone of medicine in the state. It makes available within its borders skills and facilities which formerly had to be sought elsewhere.

William H. Prioleau, President
South Carolina Medical Association.

Editorials

DO YOU WANT SOCIAL SECURITY?

Who wouldn't like to feel that regardless of all personal financial hazards he would finally reach that happy day in that happy land where he would only have to wait for the mailman to hand him a monthly check, one which would secure his existence for the next month, at least on a diet of hog and hominy if not on caviar and champagne. In a selfish way, who wouldn't want that free money derived from hypothetical earnings of generations to come, borrowed from all of us and sunk into obligations which all of us and the third and fourth generation of us are expected to pay? On the false face of the proposition the prospects look good for our immediate benefit, but there is little behind that face to encourage confidence in the economics of the whole arrangement.

In this day of something-for-nothing the social security scheme has flowered and already bears rich fruit even though at its roots soundness never did exist. Relatively few people seem to stop to doubt the health of the tree, but among the questioners has always been the physician.

Granted that the objections raised by physicians have not always referred to the soundness of "social security", but sometimes to its practical value to the medical group alone, our profession has been the one element which has stood solidly against coverage, and by its stand up to this time has discouraged the legislators from including it under an undesired blanket.

It is comforting to think that the profession is honestly convinced that "social security" is bad for itself and more comforting to think that medical men are sufficiently acute to believe that "social security" as we now know it is unsound for everybody.

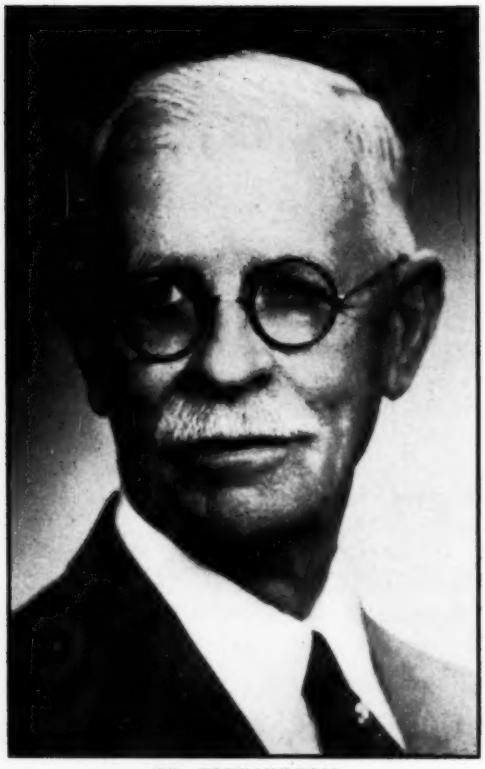
Now comes a roll of thunder on the left by that group which composes The Physicians' Forum, an organization not unfamiliar in its radical approach. The Committee on Social Security for Doctors is circularizing the country, expounding the financial benefits to be obtained from coverage of physicians by "social security", splashing the pages with guileful tables of easy money, and saying not a word about where the money comes from in the long run. This is stuff which can appeal to those who take no trouble to inform themselves, and can do much harm to all of us. Before we accept any of it, we should be familiar with the kind of information which has appeared recently in the pages of the *Journal of the AMA*, and we should be prepared to form a sound opinion on which to base our convictions and our effort to preserve our own salvation.

If the thunder can be kept far to the left and confined to a bare rumble for lack of an audience, there is less likelihood that the political lightning which creates it will strike close to us.

A MAN'S CONTRIBUTION TO HIS COMMUNITY

When one has great respect and admiration for a man it seems fitting to acknowledge this fact. The medical profession can well be proud of this man's life and contributions to his home community. Micah has said "you have been told, Oh man, what is good, and what the Lord requires of you; only to do justice, and to love kindness, and to walk humbly with your God!".

On July 23, 1867, two years after the Civil War and the year the Suez Canal was opened and that Lister published his "Antiseptic Principle in Practice of Surgery", a man was born in the lower part of Greenville County. His early life must have been difficult indeed when one recalls the economic history of that period. This man was the son of George W. and Louise Cox Richardson, native of that section, and he was one of several born of that couple. He received his primary education in the local schools and went on to study medicine in the old Atlanta Medical College, now a part of Emory University, where he received the degree of Doctor of Medicine in 1894. He came back home and began an active practice of



DR. RICHARDSON

medicine, which has now continued for more than 62 years. That he is active and beloved is fully appreciated by those of his colleagues who see him regularly at our County Medical Society Meetings and from time to time in the halls of our local hospitals. Now in his 89th year his eyes have failed a bit, but not his vision. He is at work every day and many of his present patients are grandchildren of his earlier patients. He told me recently of delivering the daughter of a man he had ushered into the world some fifty years ago. In the sixty years of his practice he has delivered more than 6,400 babies and some of them in this last year. In the 62 years of his practice he has taken two vacations of two weeks each, one for his second honeymoon in 1913 and the other for a trip to Mexico some fourteen years ago. The only other time lost from his practice was due to surgery when his gall bladder was removed about seven years ago. He began in the horse and buggy days and for many years practiced on horse back. This was before the days of the telephone and electric lights, and even after he began driving automobiles, his love of good horses continued. He did not give up riding fine saddle horses until attacks of gall stone colic made it necessary when he was 80.

In addition to a full and active practice of medicine he has found time to serve his community in many other ways. He enjoys the most remarkable confidence of his townsmen and has served as the Mayor of Simpsonville for forty consecutive years. This may well be a record of its own. He has also served as a member of the School Board for thirty years, many of them as chairman. He is a life long member of the Baptist Church and has served as superintendent of its Sunday School for twenty years.

This man has indeed devoted his life to Simpsonville and its community. The practice of medicine has been both his love and his labor. He is the only living charter member of the Greenville County Medical Society and he has continued to be actively associated with it to this day. He was president of our society about 1910 and became an honorary member a few years ago. It has been my privilege to know this great physician for more than thirty years. Never has one heard of his doing or saying an unkind thing. His ideals are high and his life truly merits the great tribute of Robert Louis Stevenson to a physician.

Lawrence L. Richardson, M. D., gentleman, Christian, civic leader, physician and friend. He has given a full measure of service to his fellow man. May there be others like him.

Hugh Smith, M. D.

LICENSURE

The readers of this journal are probably quite familiar with the many assaults of one sort and another that have been leveled at state boards. Apparently there is a rather concerted move on the part of a very small minority to take the privilege of medical licensure away from the several states and put it in the hands of a central examining body, thus conferring on a single group the privilege of licensure. The legally constituted state boards of the several states object to this centralization of authority for very sound reasons, among which one might mention:

First, taking away from the states the right to de-

cide who is to practice and who is not to practice within their borders.

Second, the lack of legal status, unless the board was set up by Congress. The present national board is suggested by some as the logical examining board for all. If this board were the sole examining body, it would not be subject to review by state courts but would be subject to the arbitrary adjudication of the federal courts, if established by Congress. As matters now stand, the action of the National Board of Medical Examiners is not subject to review by anyone. The state boards of medical examiners hold that each state has much in common with the boards of other states, but still has some differences that each state should have a right to decide. For instance, South Carolina does not admit foreigners to licensure until they become full citizens of the United States, nor does it grant licenses to those who do not hold diplomas from medical schools in the United States or Canada—while many other states, with a large foreign population, do not regard these two tenets as important.

The State Board of Medical Examiners of South Carolina met in Columbia in June to conduct the annual examinations. At this meeting many problems were brought up and discussed relative to licensure.

The first decision made was in the field of reciprocity. Here it was decided to do away with all formal reciprocal agreements with other state boards, and in the place of these reciprocal agreements, to inaugurate the principle of licensure by endorsement. Now it is possible for any citizen of the United States holding a diploma from an A grade medical school in the United States or Canada to obtain a license to practice medicine in South Carolina. The board considers it of no importance whether the states from which applicants come are willing to take, by endorsement, physicians from South Carolina. The board felt that there is no reason for South Carolina not to accept all the good doctors that want to come and practice here. What the other states do relative to South Carolina physicians is their concern.

The second matter discussed was relative to the licensing of interns, residents, and other physicians working in hospitals. It was felt by the board that all physicians should be licensed—this to include recent graduates now serving internships and residencies. This phase of the program is a little more complicated than the matter of reciprocity and endorsement. There are many points that have not as yet been fully considered, and changes may need to be made to effectively carry out the plan. However, to put before the members of the state medical association the principal points, the following is quoted from a letter sent by the chairman of the board to each member of the board and approved. Some changes will, of course, be necessary, but the principles are covered.

"1. At what date will the licenses be available?

It was my idea that these licenses would not be available until after the meeting of the board in November. Meanwhile, hospital relationships with interns would not be disturbed.

"2. Will these permits be issued to suitable applicants on a voluntary basis, or will all be required to comply?

Since the contracts with interns for the present year had already been made before this new plan was agreed upon, it would, from necessity, have to be on a voluntary basis so far as this group is concerned, but for those beginning their internships after the first of the year the licenses would be compulsory—that is, beginning January 1, 1957, or some such date.

"3. Residencies:

All physicians beginning residencies after the first of January, 1957, will be required to have a regular license, just like everybody else. This would likely not apply, at the present, to those who have already started on their residency training program under the old regime, but would apply to all residents, assistant residents, etc. who will begin their tour of duty after January 1, 1957.

"4. Narcotic licenses:

With regard to narcotic licenses, I see no reason why they should not be given a narcotic license, since under the present situation interns prescribe narcotics within the confines of the hospital for admitted hospital cases, but as I remember this point was not firmly decided on. Personally, I think it would be well for these boys to have the privilege of obtaining a narcotic license.

"5. Intern permits will be granted only to interns serving in an accredited hospital for intern training.

"6. No intern will be granted a permit for hospital training unless he can, at the termination of the internship, be eligible for a permanent license.

"7. Fee

Ten dollars, which is about as low as we can get by on—this fee not to be considered a part of the reciprocity fee if reciprocity is obtained later."

George R. Wilkinson, M. D.

STEP BY STEP PROCEDURE FOR OBTAINING TEMPORARY AND PERMANENT LICENSURE

A. Temporary Licensure

1. Write the Secretary of the State Board of Medical Examiners, Mr. N. B. Heyward, 1329 Blanding Street, Columbia, South Carolina, requesting a blank for temporary licensure.

2. Fill in the form fully. This form is rather explicit and is identical to the permanent licensure form.

3. Mail the form back to the Secretary of the State Board of Medical Examiners with a letter of endorsement from an accredited hospital or school in which you intend to work. This letter should be from the Superintendent of the Hospital or Dean of the School as the case may be, stating the date you will begin your work and the date upon which this tour of duty will terminate.

4. Enclose a letter stating that you are herewith enclosing application blank with a letter from the official of the institution and check for $10.00. State that the application is for temporary licensure.

NOTE: Temporary licenses will be available for first year internes and fellowship students.

B. Permanent Licensure

1. Write the Secretary of the State Board of Medical Examiners, Mr. N. B. Heyward, 1329 Blanding Street, Columbia, South Carolina, requesting a blank for permanent licensure on the basis of endorsement.

2. Fill in the blank and mail it back to the Secretary of the Board. The Secretary will review the blank and if everything is in order will notify the applicant the time and place of the next meeting of the Board.

3. Should the applicant, for good reasons, desire to obtain permanent licensure earlier than the next meeting of the Board he may request the Secretary by letter for an appointment to appear in person before a committee of the Board in Columbia, South Carolina. The Committee consists of Dr. Harold E. Jervey, Jr., Columbia, South Carolina, Dr. K. D. Shealy, Columbia, South Carolina and Mr. N. B. Heyward. If there is no controversial point the Committee will approve the applicant for endorsement and the license will be straightway processed. The Committee is authorized to approve applicants by endorsement only when all points are quite in order. The application, without prejudice, may be deferred until the full meeting of the Board.

4. The fee for licensure is $50.00 and is payable at the time of appearance either before the Committee or the Board.

NOTE: Permanent licensure will be required by all physicians one year after graduation or completion of their first year's internship. This includes assistant residents, residents, and graduate students doing clinical work. It will not be required for graduate students strictly in laboratories where no legal liability is assumed.

It will be noted that the application for temporary licensure is precisely the same as that for permanent license and all procedures are identical except three: (a) Personal appearance before the Board or Committee of the Board is not required. (b) A letter of endorsement from the institution from which the applicant will work is required. (c) The fee is $10.00 instead of $50.00.

C. After one year of temporary licensure in an accredited institution should the holder of the license desire permanent licensure the procedure will be as follows:

1. Write the Secretary of the State Board of Medical Examiners, Mr. N. B. Heyward, that a permanent license is desired giving the number of the temporary license held and the name of the hospital or school in which the year's work has been done.

2. Enclose in the letter a statement from the Superintendent or Dean as the case may be on the official stationery of the institution. It should contain the dates when work was started and when completed together with appropriate remarks concerning character of the applicant and whether the work done was satisfactory or not.

3. The Secretary of the Board will write the applicant when and where to meet the Committee or the Board.

4. Appear at the appointed time bringing along the certificate or diploma from the hospital or school and other addenda stated in the original application form. This includes medical school diploma and licenses previously issued, if any.

5. The fee is $50.00.

D. For those who have not been previously examined by any State Board of Medical Examiners:

1. Write the Secretary of the Board of Medical Examiners, Mr. N. B. Heyward, 1329 Blanding Street, Columbia, South Carolina, requesting application blank to take the written examination.

2. Fill in the blank completely.

3. A letter will be written to the applicant by the Secretary of the Board of Medical Examiners when and where the examinations will be held.

4. Registration for the examination usually takes place the day before the examination begins. At the registration meeting all applicants may be registered that qualify under the law.

It may be well to state here that no changes have been made relative to the procedure in obtaining permanent licensure either by examination or endorsement.

The candidate for examination or endorsement must be a citizen of the United States holding a diploma from a grade A Medical School in the United States or Canada. These requirements apply to all applicants both temporary and permanent.

This program is not designed to affect contracts already entered into but will be enforceable at the expiration date of the present contracts. Licenses will be obtainable January 1, 1957 and thereafter so far as internes go in particular. Licenses will be required of all beginning their internship after January 1, 1957.

The Board of Medical Examiners is a part of the State Judiciary. It is not a part of the enforcement component. Complaints to the Board may be made only against individuals who have been licensed by

the Board. These complaints may arise from the Department of Justice, County Solicitor or Counselors of the District in which the physician is practicing.

For institutions to cover their workers by insurance, licensure is necessary. Physicians doing any sort of practice that may entail liabilities should be licensed. The holder of a license is legally an accredited physician when his license has been registered in the Court House in the county where he practices.

DISABILITY INSURANCE BENEFITS UNDER SOCIAL SECURITY

"Public Law 880"

Disability is defined under Public Law 880 as, "The term 'disability' means inability to engage in any substantial gainful activity by reason of any medical determinable physical or mental impairment which can be expected to result in death or to be of long-continued and indefinite duration. An individual shall not be considered to be under a disability unless he furnished such proof of the existence thereof as may be required."

The determination of physical disability at age 50 under Social Security is under the United States Department of Health, Education, and Welfare, Social Security Administration.

There are eight (8) offices in the State, in addition certain border counties are handled out of Savannah and Augusta.

Mr. William Nixon is in charge. The next higher echelon, so far as disability reports are concerned, are offices in Baltimore (moved from Washington).

Applications for disability benefits at age 50 are being received as of October 1, 1956. Payments will not start until July 1, 1957.

A person under Social Security must have been disabled for six (6) months before his application will be received. Under Social Security the age for men is 65 and women is 62. Under regular Social Security the person may earn as much as $1,200.00 a year before it affects his Social Security check. Under the disability provisions he cannot earn that nor any substantial sum as it would be construed that he is not disabled as defined under law.

STEPS IN SECURING DISABILITY PAYMENTS AT AGE 50 ARE:

1. Applicant 50 years or over writes in to the Social Security office that he is disabled and that he desires to avail himself of the benefits.
2. He is given a preliminary questionnaire. (Form 08-D820)
3. He sends in basic questionnaire form to local office.
4. While this is being done local office gets work report from Baltimore office.
5. If he is found properly eligible to apply, he fills out "Application to Establish Disability" questionnaire. This questionnaire, among other things, lists the doctors and hospitals he has visited.
6. Applicant signs letter permitting doctor who treated him to furnish information to Social Security office.
   (note) If applicant is too disabled to come to Social Security office to fill out the above two forms, the Social Security office will send someone from the office to him.
7. Applicant takes or sends medical form and "release" to doctor who treated him with the request that he fill it out. (Form OA-D826)
8. Doctor fills this from his record. If present physical status is desired the patient will ask for it.
9. The applicant pays for it.
   (note) It is incumbent upon the applicant to furnish proof of disability.
10. The doctor is not asked to render an opinion as to disability. It is important to note date of onset and prognosis.
11. The doctor sends the completed (or as near as he can) form direct to the Social Security office. It is not given to the applicant. A narrative report may be sent in instead of the medical report form.
12. When local Social Security office receives the doctors report, the papers are then sent to Vocational Rehabilitation office of the State Department of Education.
13. Vocational Rehabilitation office reviews this and if not sufficient evidence to make determination of disability they look further. They have lay boards plus medical doctor. The Vocational Rehabilitation determines disability on evidence submitted.
14. Papers are then sent to Baltimore office for review. They have board of doctors for consultations. Standard guide for all states.

There is a situation in which the Government might pay for an examination. That is this: If a person is on disability and the Government has reason to believe that he is no longer disabled, the Government might have this person examined to determine his present physical condition.

In addition to the disability at age 50, there are two other conditions in which one may be "disabled" under Social Security.

1. Children under 18.
   If the father or mother is receiving old age insurance or if the child has lost the support of a father thru death and the child is disabled before age 18 and continuously so, he may draw disability insurance.
2. Those disabled before age 50.
   If under Social Security and a person becomes disabled before 50, they may have their Social Security record "frozen" which will protect them and allow them to start drawing disability Social Security at age 50.

To sum up:

1. The doctor is not asked to render an opinion as to disability of applicant.

2. It is up to the applicant to have the medical form filled out. He pays for it.
3. The doctor is asked to fill out as much as he can, not necessarily each section.
4. If recent examination is necessary the patient will request it.
5. In case of children's disability, it must have begun before age 18. That is, the disability existed and continued before 18 years of age.
6. Medical evidence as to date of onset and prognosis of the case is important. Note the definition disability says in part—"____ impairment which can be expected to result in death or to be of long-continued and indefinite duration__".

Frank C. Owens
Chairman, Committee on Legislation and Public Policy

The results of the Grand Rapids-Muskegon study after 10 years of observation indicate that the adjustment of the fluoride content of a communal water to an optimal level (approximately 1 p.p.m. fluoride) will produce the following effects:

1. A striking reduction in the prevalence of dental caries in the deciduous teeth. At the peak of prevalence, namely 6 years of age, the caries rate for the deciduous teeth was reduced by about 54 percent.

2. A marked reduction in the prevalence of dental caries in the permanent teeth. In children born since fluoridation was put into effect, the caries rate for the permanent teeth was reduced on the average by about 60 percent.

3. Some benefit among persons whose teeth having already formed or erupted when fluoridation is begun.

4. No undesirable cosmetic effect from dental fluorosis.

Pub. Health Rep. 72-657 (July 1956)

PRESS COMMENTS

DR. J. E. ORR

The country doctor, as those of us old enough to remember once knew him, was a man who served humanity as his first duty. He traveled the good roads and the muddy roads to get to the ailing, regardless of the time of day or night.

The country doctor was one of his community's leaders, and he served all the people, regardless of station in life.

Such a man was Dr. James E. Orr of Seneca, who passed away Tuesday morning. He will be missed in our community, because he was one of those who placed service to his fellow-man before self.

Dr. Orr was a brilliant man, recognized in medical circles throughout the South for his skill in diagnosing and treating illnesses of all kinds.

Dr. Orr was a friendly man, with that gentle manner that put a patient at ease the minute he stepped into the sickroom.

Much more could be said about Dr. Orr, for he was a man of accomplishments. In his many years of service throughout this area he made a host of friends who will long remember him and love his memory.

Seneca Journal, Aug. 29, 1956

BYERLY HOSPITAL

Announcement is made in today's paper of the purchase of the Byerly Hospital in Hartsville by the Board of Trustees of that institution. The purchase was made from Dr. W. L. Byerly, Sr., founder of the hospital and guiding spirit in its growth.

According to the announcement, the purchase does not mean any change in management or in staff. Dr. Byerly will continue as superintendent.

The purpose of our comment is to say that the Byerly Hospital fulfills the dream of a man who has been completely dedicated to his profession for many years. That man is Dr. Byerly himself. A greatly beloved physician, he is one of the few remaining "old school" men of that profession. In clinic and hospital and home, he has served the people of his area with a devotion that is rare and a skill and knowledge that have kept abreast with the progress of medical science.

During recent years Dr. Byerly has added new wings to the hospital which have increased its capacity for hospital service. The change of ownership promises continued expansion, we are told.

The Florence Morning News joins with the people of Hartsville in welcoming this announcement. It will afford Dr. Byerly opportunity to pursue his profession relieved of the burden of ownership.

Florence Morning News, Aug. 17, 1956

During the spring of 1954 the Johnston Jaycees elected, Dr. Sam Garrison as Local President for the following year. This in itself was rather unusual since a Doctor has practically no free time to participate in Jaycee work, much less do all the work that Local President calls for. But Sam somehow found time to do much Jaycee work and came up with a record such as this:

(1) Sponsor football game to raise money for band uniforms, (2) Assistance given Garden Clubs in "Jitterbug Campaign," (3) Float entry in Christmas parade, (4) Football banquet and trophies to outstanding player, (5) Goodfellows project which contributed food to approximately 40 needy families at Christmas, (6) Christmas lighting contest, (7) DSA banquet—young man of year was not a Jaycee but went

Dr. Sam Garrison, left, and Dr. Bodie

on and won State DSA Award, (8) Surplus clothes project—clothes to approximately 20 needy families, (9) Telephone etiquette project, (10) National Sunday School week, (11) Started Jaycee paper headed by Bill Gable. To add to this and as a fine record, over 80% of the membership participated in one or more of the individual projects.

When it finally came time in the spring of 1955 for Sam to lay down the gavel, there was another able-bodied Doctor named U. Hoyt Bodie to take his place as head of the Local Organization. Right from the start Hoyt laid down the law of more work and outlined the projects to be carried out. The first project Dr. Hoyt Bodie started was a membership campaign which ended up increasing the membership by about 35%. Next, came a safety program which gained national publicity for its efforts, due to chapter publicity through the local paper and Johnston no accident record. Next came a campaign to raise money to carry on Jaycee work in the form of Birthday Calendar sales which went over in a big way with about 30% of total population of Johnston subscribing. Fourth, came the "Goodfellow campaign" which again gave food to approximately 50 needy families. Fifth, in close succession, was a Jaycee sponsored Christmas dance and Christmas lighting project which caught on with a bang. Sixth, shortly after this, came the VOD contest and awards to the winners, the male beauty contest—won by Dr. U. Hoyt Bodie. Seventh, came the DSA banquet and due to his hard work as a Doctor, Jaycee President and participation in church and local affairs, Dr. U. Hoyt Bodie received the Outstanding Young Man of the Year Award. We think he very well deserved it. Eighth, on the same program was the Young Farmer Award which went to Lewis Holmes for his outstanding scientific farming practice. Although he is not a Jaycee, he is very active in numerous groups and also went on to win the State FOYF Award. Ninth, after all this was over, Dr. U. Hoyt Bodie did not stop but took on even more work in the form of a model airplane contest and the Junior Citizenship Award is now in the process of being completed. He also put local Jaycee paper on basis with any Jaycee paper anywhere with aid of Bill Gable. We do not know what the last few months of Hoyt's administration will hold, but we feel sure it will be more work and fun for the local chapter.

By Lawrence Hagan
Publicity Chairman
ACTION, May 1956

ANNOUNCEMENTS

The Duke University School of Medicine cordially invites you to attend and participate in its Thursday Teaching Program. This program began Thursday, October 11, and will continue throughout the year on each succeeding Thursday.

The schedule of instruction is as follows:

10:00-11:00 Conference alternating between Pediatrics, Psychiatry, Obstetrics and Surgery

11:00-12:00 Clinicopathological Conference

12:00- 1:00 Medical Grand Rounds

1:00- 2:00 Lunch as the guest of the Faculty of the School of Medicine.

Those who desire to work in the various clinics or observe are cordially invited to do so. No previous arrangement is necessary for any of the above exercises.

Category I credit is allowed by the American Academy of General Practice. In order to obtain this credit it is necessary to register with the Director of Postgraduate Medical Education, Duke Hospital.

MEDICLINICS second annual postgraduate refresher course will be held in Fort Lauderdale, Florida, March 4-14, 1957.

The Florida Academy of General Practice is the local sponsor of the course. The American Academy of General Practice has certified this course for 32 hours of formal postgraduate study—Category I—for those Academy members in attendance.

The course consists of 32 hours of lectures and panels conducted by a faculty well able to present the varied subjects in the several fields of medicine.

The program also lists seven (7) luncheon meetings in addition to the 32 hours of lectures and panels. Attendance at the luncheons is optional and will be limited to forty (40) participants in order to stimulate informal discussion of the subject. The cost of each luncheon is $2.50 per plate.

Registration is limited to 300 in order to preserve the informal and intimate atmosphere in the lecture room.

The tuition fee for the course is $50.00 payable in advance. Checks should be made payable to MEDICLINICS and mailed to 516 Medical Arts Building,

Minneapolis 2, Minn. Registration will be closed when the limit is reached. If you desire to attend luncheons, please include with your check $2.50 for each luncheon you wish to attend and list those luncheons.

CORRESPONDENCE

September 26, 1956

Dr. J. W. Jervey
Greenville, S. C.

Dear Dr. Jervey:

If the "comic strip", *Rex Morgan, M. D.*, is carried by a newspaper in your area, you will note that the subject of glaucoma is under discussion at present and the value of a medical examination is being emphasized. It is likely that the Optometrists will be in full cry and claim to be discriminated against because of their superior college *level* training of five years, the fact that they make 75% of the eye examinations and that they claim to be well qualified to make medical diagnoses. The experience being related in this series of sequences in the "strip" are exactly those experienced by the author with respect to his own father. They are, therefore, factual and are augmented by medical background.

It is important that the author be upheld in every possible way. If there are "letters to the editor" from Optometrists, have your local Medical Society or Ophthalmic Society prepare an adequate answer. In their preparation, the following might be of some help. There are only three Optometry Schools now connected with Universities, namely, Ohio State, California, and Houston, and in these the attendance is dwindling. Columbia has closed its School of Optometry. Their private schools, of course, by no means reach the educational level of our pre-med. or medical schools, and this point should be developed. Ophthalmologists now do 55% of the eye examinations made in this country annually, on the basis of factual figures obtained from our leading optical houses, and this percentage is increasing daily. The Optometrists have always claimed that we made but 25%. All of you have patients who have suffered the same experience as Melissa. If possible, get such patients to write a "letter to the editor".

The American Optometric Association will undoubtedly make every effort to submarine and sink this column for which Nick Dallis, M. D. has just been presented a special citation by the American Medical Association, the United States Food and Drug Administration, the American Cancer Society, and the President's Committee for Employment of the Physically Handicapped. Defend it to the utmost.

Sincerely,
RALPH O. RYCHENER, M. D.
Chairman, Public Relations Committee
Section on Ophthalmology of the A.M.A.

DEATHS

DR. J. LEWIS SMITH

Dr. J. Lewis Smith, 74, retired physician of Columbia, died July 12, 1956.

Dr. Smith was a graduate of Furman University and Medical College of South Carolina. Until his retirement several years ago, he practiced and resided in Williston. For a number of years he was surgeon for the Southern Railway Company.

DR. JAMES ALECK KELLEY

Dr. James Aleck Kelley, 37, Georgetown physician and surgeon, died October 5th. He had been in declining health for some months and seriously ill for the past month.

Dr. Kelley was born Feb. 13, 1919, at Kingstree and was a son of Dr. Edward Theron Kelley and the late Mrs. Lorena Ross Kelley. He was educated in the schools of Kingstree and was graduated from the Citadel in 1940, and from the Medical College of South Carolina in 1943.

Following his graduation, he worked with his father in the operation of Kelley Memorial Hospital in Kingstree for several months. During World War II, he served in the Army Medical Corps, as a captain in the paratroopers, in the Pacific Area.

After his discharge, he took graduate courses in surgery at Bellevue Hospital in New York and at Horace Harding Hospital on Long Island. Dr. Kelley went to Georgetown in 1949 and since that time has been associated with his father in operation of the Kelley Clinic.

DR. DAVID A. WILSON

Dr. David A. Wilson, 46, Greenville surgeon, died Sept. 17, following several months of illness.

Dr. Wilson was a native of East Liverpool, Ohio.

His early education was received in the East Liverpool schools. He received his A. B. degree from Wooster, Ohio; his M. A. degree from Wesleyan College, Middletown, Conn., and his M. D. degree from Ohio State University, Columbus, Ohio.

He did his residency in general surgery at Duke University and in 1946 began the general practice of medicine and surgery in Greenville.

He was also a member of the Greenville County Medical Society; the South Carolina Medical Association; the American Medical Association; the Southern Medical Association; the S. C. Surgical Society; the Southeastern Surgical Congress; the American College of Physicians and Surgeons; a Fellow in the American College of Surgeons, and a member of the American Board of Surgery. He served as president of the South Carolina Surgical Society during 1955-1956.

NEWS

The Seventh District Medical Association met at Georgetown on September 20. The speakers heard were Drs. William H. Prioleau, Robert M. Paulling, Edward F. Parker, R. Maxwell Anderson, and Lawrence L. Hester, Jr., all of Charleston.

Greenville Medical Day sponsored by The Greenville County Medical Society and the Staff of the Greenville General Hospital was held on October 2, 1956. The speakers were Drs. William W. Pryor, James A. Manning (of Rochester, N. Y.), Charles A. Huffnagel, Frank F. Espey, W. Thomas Brockman, and R. Bruce Logue (of Atlanta).

The Southeastern Allergy Association will meet in Charleston in October 1957. Dr. Katherine B. MacInnis of Columbia is the secretary-treasurer.

Dr. Vernon B. Moore, Greenwood, has been appointed on the Committee on Maternal Health replacing Dr. John Fleming, resigned.

Horry County has withdrawn its affiliation with the Pee Dee Medical Association.

State Societies Move Rapidly On 'Medicare' Arrangements

More than three-quarters of the state medical societies have taken action looking toward start of the military dependent medical care program (medicare). They have indicated they have decided on their contracting and disbursing agents, have agreed to submit fee schedules, and to set up committees that will settle medical questions and work-out changes in the fee schedules from time to time in the future.

Of the states active in preparations, approximately 80% have indicated they will do their own contract negotiating for the doctors of the state.

After regulations have been drawn up by Defense Department in cooperation with the Department of Health, Education, and Welfare, Defense Department plans to call representatives of the state societies to Washington. Here contracts will be worked out for the individual states.

On the hospital care phase, Defense Department is moving ahead with plans for dividing up the country between Blue Cross and commercial insurance companies. Negotiations for this part of the program will continue for several weeks.

Louis P. Jervey, Jr., M. D. announces the opening of his office for the practice of internal medicine at 95 Rutledge Avenue, Charleston.

Dr. S. Edward Izard of Charleston has been accepted as a fellow of the American College of Surgeons. He was one of nine South Carolinians so honored.

Others are Drs. James Allen and Norman D. Ellis, Jr. of Florence; George F. West of Camden; Phillips L. Bates and Vernon B. Moore of Greenwood, Homer J. Hancock and Samuel H. Huff, Jr. of Anderson and Wendell H. Tiller of Spartanburg. The elections were announced during closing ceremonies of the organization's annual clinical congress.

"In terms of current earning power," reports *Medical Economics* in its October issue, "the four top specialties seem to be radiology, neurosurgery, orthopedic surgery, and plastic surgery." The magazine bases its conclusion on results obtained from its eighth Quadrennial Survey of doctors' incomes.

The survey shows that the typical self-employed radiologist nets $25,040 yearly; the neurosurgeon, $24,988; the orthopedic surgeon, $24,967; and the plastic surgeon, $23,050.

A.M.A. President Dwight H. Murray and Julian P. Price, Florence, South Carolina, a member of the A.M.A. Board of Trustees, appeared on the final day's program of the 58th annual convention of the American Hospital Association in Chicago.

Dr. Murray, one of five speakers on the final general session program, covered two important problems: continuing good patient care and hospital-physician relations.

"I would be less than frank," he said, "if I did not say that the medical profession is concerned by and vitally interested in the attempts by certain hospitals . . . direct or indirect . . . to inject themselves—in our opinion improperly—into the practice of medicine."

Dr. Murray said that the hospital control of medical practice cannot possibly serve the best interests of the patients, but will only restrict or destroy the professional freedom and independence of the physician to practice the science and art of healing.

Dr. Price, who is one of the A.M.A. representatives on the Joint Commission on Accreditation of Hospitals, served as moderator of a panel which discussed for an hour and a half the subject: "The Hospital and Changing Patterns of Medical Care."

Dr. Price's comments reflected his own experiences in a Chicago hospital where he was confined for three days during the annual A.M.A. meeting last June.

Jovial and smiling, Dr. Price said hospitals today are "a domain of dedicated women," adding that during his stay in the hospital he had contacts with only three men—the attending physician, the orderly, and the chaplain.

A.M.A. Secretary's Letter

Dr. Samuel T. Burnett of Saluda county has recently gone to Anderson, to practice medicine with Dr. James G. Halford, Jr., of Johnston, and Dr. Robert G. Thompson.

Dr. Burnett attended Furman University. Then,

setting his goal on pharmacy, he entered the University of South Carolina and, after receiving his degree went to Bishopville where he worked for some time as a pharmacist. Soon he reentered college, receiving his M. D. from the Medical College of South Carolina and interned at the University Hospital in Augusta.

Dr. Herbert L. Allen, who has been a medical practitioner in Bamberg for the past three years, has left for Melbourne, Fla., where he will be located.

Dr. Malcolm U. Dantzler, Georgetown County Health Officer for the past three years, has recently been awarded a United States Public Health Service Traineeship for graduate study in the field of public health administration.

Dr. Dantzler plans to enter shortly the School of Public Health of the University of North Carolina.

During his absence, the work of the Georgetown County Health Department will be directed by Dr. Harold S. Gilmore, who has been with the department for the past two years.

Distribution of $2,455,802 in federal funds for hospital and health center construction and plans for a program for mentally retarded children have been approved by the executive committee of the South Carolina State Board of Health.

The approved distribution of federal funds for hospital and health center construction gives 66 per cent of the total amount to general hospital construction. The allocation was $1,620,829.32.

Mental hospital construction will receive 9 per cent of the total funds, or $221,022.18; health centers, 15 per cent, or $368,370.30 and the remaining 10 per cent, or $245,580.20, will be in reserve.

No funds were alloted for T. B. hospital construction.

Counties selected to participate in the construction program must match federal funds with local funds.

The approved plan for a program for mentally retarded children will amount to $80,000.

Screening clinics will be established in strategic areas throughout the state, Dr. G. S. T. Peeples, South Carolina health officer, said yesterday.

The children determined rehabilitable will be referred to the Medical College at Charleston for necessary diagnostic tests and treatment, he said.

Dr. Lawrence Ennis Eddlemon has announced the opening of offices for the general practice of medicine in Startex Medical Building at Startex.

A native of Phoenix, Arizona, Dr. Eddlemon is a graduate of La Sierra College, Arlington, California, from which he holds a B.A. degree in chemistry. He received his M.D. degree at the College of Medical Evangelists School of Medicine and completed his internship at General Hospital, Spartanburg.

Drs. Frank H. Stelling and Leslie C. Meyer announce the association of Dr. Edwin H. Martinat in the practice of orthopedic surgery at 9-11 Medical Court, Greenville.

Drs. S. Edward Izard and Ritchie H. Belser announce the removal of their offices for the practice of orthopedic surgery to 112 Ashley Avenue, Charleston.

Dr. Henry Donato announces the removal of his office to 77 Rutledge Avenue in Charleston for the practice of general surgery.

Dr. Reynolds Young, a native of Due West, has opened an office in Anderson for the practice of medicine. Dr. Young attended Erskine College and Vanderbilt School of Medicine. He interned in Philadelphia and completed his residency in Denver, Colorado.

Dr. J. Pierce Horton, Jr., Lancaster physician, has been named chairman of the 1956 Christmas Seal Sale in Lancaster county.

Dr. Benjamin O. Stands, Columbia pediatrician, has been appointed chairman of the Richland County Red Cross blood program for 1956-57.

Dr. Stands succeeds Dr. William M. Bryan, Jr., for the term of office beginning July 1.

Dr. James Arthur Dunlap, Jr., has announced the opening of the Ruby Medical Clinic

Dr. Dunlap is a native of Charleston. He received his Bachelor of Science degree from the College of Charleston. He entered the Medical College of South Carolina, and served his internship at Roper Hospital. Upon completion of his internship he served two years with the United States Navy and was attached to the United States Marine Corp. in Korea and Camp Pendleton, California.

Dr. R. W. Penick has opened an office at 100 S. Memminger Street for a practice limited to pediatrics, according to the Greenville County Medical Society.

Dr. Charles N. Wyatt, Greenville, was elected president of the South Carolina Chapter of the American Academy of General Practice. He replaces Dr. Hervey W. Mead, Pendleton.

Other officers are Dr. Homer M. Eargle, Orangeburg, president-elect; Dr. I. Ripon Wilson, Charleston, vice-president; Dr. Horace M. Whitworth, Greenville, secretary-treasurer; and Dr. J. H. Cutchin, Easley, director.

The group took action toward setting up a memorial loan fund honoring the late Dr. W. L. "Buck" Pressly, Due West, who was selected by the Anderson Medical Association as the 1948 Family Doctor of the Year.

The academy plans to sponsor the self perpetuating fund. The plan discussed today would require the raising of $5,000 from this group and also from all

doctors in South Carolina. A maximum of $500 would be available to South Carolina students above the freshman level at the Medical College of South Carolina.

Whitten Village continuues to expand in an effort to meet the public demand of applications to this state institution for the training of slow learning children.

It is today in the midst of a $750,000 building program which is adding four new dormitories to its campus, located two miles northeast of Clinton.

And even as these buildings go up, superintendent B. O. Whitten points ahead to other pressing needs which must be met in the near future.

Three dormitories, costing a total of $313,800 and with capacity for 200, almost are completed. The largest of these, a $153,797 building to house 115 girls, is scheduled for occupancy the latter part of this month. Shortly thereafter, two dormitories of 40-bed capacity each will be ready for use.

The foundations have been laid, meanwhile, for a fourth dormitory. This structure will cost $155,000 when completed and will be used to house the more emotionally disturbed male residents.

Plans also are underway to begin construction on a new fully equipped central kitchen as soon as possible and to improve dining facilities generally. These are to be included under the $750,000 appropriation.

Such activity over the next few months will permit Whitten Village to expand its enrollment from the present 1,821 to more than 2,000. This increase will relieve most of the pressure as the institution seeks to perform its primary function of training slow learning children, some of whom are under-privileged and some emotionally disturbed, and the secondary function of providing supervision, nursing and custodial care of many who cannot do academic work.

BOOK REVIEWS

PSYCHOSOMATIC ASPECTS OF SURGERY. Edited by Alfred J. Cantor, M. D. and Arthur N. Foxe, M. D., 215 pages. New York: Grune and Stratton, 1956. Price $6.50.

This work consists of the major papers presented at the first Annual Teaching Seminar of the Academy of Psychosomatic Medicine, held in New York City in October, 1954. The seminar was concerned with the psychosomatic aspects of surgery, anesthesia, obstetrics and gynecology and the surgical subspecialties. Reports on those subjects were presented by authorities recognized in their respective fields. Psychiatric discussions of each of the papers were conducted by psychosomatic specialists. Such an arrangement proves to be advantageous and interesting to the reader.

Of interest was a remarkable case presented by a psychiatrist in the section on breast surgery. A mother is reported in whom a lung metastasis secondary to recurrent breast cancer disappeared after a long quarrel with her daughter was resolved. The reviewer suspects that an area of atelectases or pulmonary infarction is more likely to clear in the interval of jubilation that followed their reunion than is an established neoplastic metastases.

Since it is often heard that the surgeon has the least psychiatric orientation of the medical specialists, the probable greater appeal of this book to the surgeon than to the psychiatrist may be well-directed. The papers presented by the surgeons indicate that psychosomatic orientation has been achieved by the well-informed surgeon. In order to expand such a process, this work is recommended to students, surgical trainees and surgeons wishing to improve this facet of their practice.

Louie B. Jenkins, M. D.

ELECTROCARDIOGRAPHY—by Louis Wolff, Beth Israel Hospital and Harvard Med. School. 2nd Edition—W. B. Saunders Co., Phila. Price $7.00.

This is the second edition of a textbook that first appeared in 1950. The author reviews in some detail the fundamentals of modern electrocardiographic theory, devoting the first seventy pages to this. The various disorders commonly discussed in electrocardiograph texts are then taken up, with constant reference to the fundamental theory in explanation of changes. Some passing mention of vectorcardiographic analysis is made where it will be helpful, and a very useful section on arrhythmias has been added. In comparison to current widespread interest, the discussion of abnormal electrolyte patterns was quite brief.

John A. Boone, M. D.

TREATMENT OF HEART DISEASE. By Harry Gross, M. D. and Abraham Jezer, M. D. W. B. Saunders Co.—Phila.—Price $13.00, Pp. 549.

This book reviews the mechanism of symptoms and the physiological basis of the efficacy of various forms of treatment in heart disease.

This form of presentation of therapy makes this an excellent book, especially for the general physician. It is remarkably complete and gives disadvantages and advantages of various methods of management. Also useful cardiac diets and menus are described and a valuable chapter is devoted to "Living with the Sick Heart". There are adequate illustrations to stress many points in the text. Even though the authors give many of their own ideas, yet they compare these with others and do not try to distract from other opinions.

It is a remarkable presentation of therapy and heart disease based upon sound physiological principles.

Venous Return. By Gerhard A. Brecher. 128 pages. New York 1956. Grune & Stratton. Price $6.75.

This book is a comprehensive study of venous return and its relationship to cardiac outflow. It is based on measurements of venous flow, using specially devised flow meters. An interesting historical investiga-

tive background is correlated with present day research problems. The methods used to study venous flow are amply described and illustrated.

The respiratory pump, the effects of artificial respiration and heart action on venous return, and the venous hemodynamics in the normal patient as well as in those patients with cardiac valvular lesions are comprehensively presented. The discussion of venous return in open and closed heart surgery is especially applicable to the cardiac by-pass pump methods, where a balance between the aspiration of blood from the low pressure vena cava is made with the injection of blood into the high pressure arterial systems. Of the combined components which normally contribute to venous flow, i.e. the ventricular ejection, the respiratory pump, the systolic ventricular attraction, the diastolic ventricular suction, the muscle pump, and venomotor activity, all except the last are essentially abolished during open cardiac surgery using artificial pumps.

The monograph should be of interest to the laboratory investigators and clinicians alike. It is essential to the cardiologist and cardiac surgeon.

J. Manly Stallworth, M. D.

TEXTBOOK OF MEDICAL PHYSIOLOGY. Arthur C. Guyton, M. D., W. B. Saunders Company. Philadelphia and London 1030 pages; 577 figures. Price $13.50.

This is a completely new textbook treatment of physiology. The key for appreciating it is given in the first two sentences of its preface: "—— it is not a reference for physiologists. Instead, it is a textbook written for students". As such, it merits praise of several different kinds. First, for unusual clarity in presentation based upon a direct, concise literary style and upon outstandingly well chosen, clean, and informative figures. Further, treatment of the several divisions of physiology is well balanced and adequately comprehensive, at least for initial handling by medical students. In addition, there is a chapter on nuclear physics, x-rays and their relationships to the human body which constitutes coverage beyond that found in most texts.

The work is distinguished for the skill with which pathologic function is used to illustrate physiological principles and with which physiology, as the study of body processes, is brought to bear upon normal and abnormal alike. It is noteworthy, too, for its handling of biophysical principles in relation to physiology. There are many who, recognizing the importance to medicine of numerous developments in biophysics, feel that this science should be added to the medical curriculum as a separate subject in its own right. Others, though equally impressed, oppose such isolation and feel that biophysical principles should be incorporated into the teaching of all medical subjects, wherever pertinent. Dr. Guyton's book is an excellent example of how the latter may be done and in his hands biophysics appears, rightly, as an integral part of physiology rather than as a subject apart.

On the debit side, there are features which, even though they stem directly from the effort to make a complex subject more readily understandable, will be labelled as flaws by some critics. One of these is recognized by the author himself when he states, "Unfortunately, the effort to be concise has led to more dogmatic presentation ------ than I ordinarily would have desired". The other is that, although there is a list of publications at the end of each chapter, no references whatever are made to these in the text. While this omission aids materially in achieving a publisher's ideal of a clean, uncluttered page, it may also lead to frustration for those students in whom the author may succeed in developing an inquiring attitude of mind. But despite minor flaws the major impact of the work is excellent, especially if the initially stated limitation on its objectives is kept in mind.

In a highly competitive field in which at least five major works in English are firmly entrenched already, a new textbook of physiology must present solid virtues and a real contribution to teaching technique if it is to survive. It may be anticipated that this newcomer in the field will survive and, further, be warmly welcomed by the undergraduate medical students for whom it was written and also by graduate physicians who will find its approach refreshing and helpful.

Theo. G. Bernthal, M. D.

DICTIONARY OF POISONS by I. and E. Mellan. Philosophical Library, N. Y. Pp 147—Price $4.75.

This is a book for popular use. Treatments prescribed are simple but adequate, and end generally and appropriately with the advice to "call a physician immediately". The introductory descriptions of the histories of individual poisons should be of much interest to any reader.

J.I.W.

A RESEARCH MILESTONE

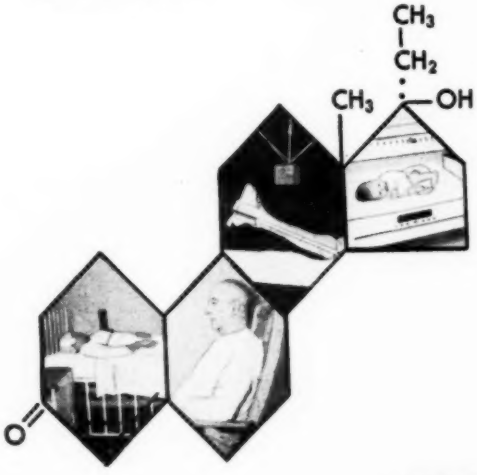
Nilevar*

(BRAND OF NORETHANDROLONE)

Searle's New and Practical Steroid Specifically for Protein Tissue Building

It has long been recognized that a substance which would promote protein anabolism would be of inestimable value in therapy. The androgens have this property, but unfortunately they also exert actions on secondary sex characteristics. These effects are commonly undesirable in therapeutic programs.

THE FIRST STEROID WITH ANABOLIC SPECIFICITY—Nilevar, the newest Searle Research development, therefore, meets a long desired clinical need because Nilevar presents the first steroid primarily anabolic for protein synthesis. Moreover, Nilevar is without prominent androgenic effects (only about one-sixteenth of that exerted by the androgens).



OBJECTIVE AND SUBJECTIVE RESPONSE—Orally effective, Nilevar therapy is characterized by retention of nitrogen, potassium, phosphorus and other electrolytes in ratios indicative of protein anabolism. Moreover, subjectively the patient observes an increase in appetite and sense of well-being.

WELL TOLERATED—Nilevar has an extremely low toxicity. Laboratory animals fail to show toxic effects after six months of continuous administration of high dosages. Nilevar should not be administered to patients with prostatic carcinoma. Nausea or edema may be encountered infrequently. Slight androgenicity may be evidenced on high dosage or in particularly responsive individuals.

MAJOR INDICATIONS—Preparation for and recovery from surgery; supportive treatment of serious illnesses (pneumonia, poliomyelitis, carcinomatosis, tuberculosis); recovery from severe trauma and burns; decubitus ulcers; care of premature infants.

DOSAGE—The daily *adult* dose is three to five Nilevar tablets (30 to 50 mg.) but up to 100 mg. may be administered. For *children* the average daily dose is 1 to 1.5 mg. per kilogram of body weight; individual dosages depend on need and response to therapy.

SUPPLY—Nilevar is available in uncoated, unscored tablets of 10 mg. G. D. Searle & Co., Research in the Service of Medicine.

*Trademark of G. D. Searle & Co.

SEARLE

Left to Right: Dr. William H. Prioleau, President, S. C. Medical Association, who was speaker at the Fall Executive Board Luncheon of the Woman's Anxiliary in Newberry, September 12, Mrs. E. Gordon Able, President of the Woman's Adxiliary to the S. C. M. A.; Dr. D. L. Smith, President-Elect of the S. C. Medical Association and Mrs. Smith who were guests at the Luncheon.

WOMAN'S AUXILIARY
SOUTH CAROLINA MEDICAL ASSOCIATION

President: Mrs. E. Gordon Able, Newberry, S. C. **Bulletin Secretary: Mrs. Ritchie Belser, Charleston, S. C.**

PRESIDENT OF S.C.M.A. SPEAKS TO WOMAN'S AUXILIARY BOARD

Members of the Woman's Auxiliary to the South Carolina Medical Association attending the fall Board Meeting of their organization in Newberry, on September 12th, heard as guest speaker Dr. William H. Prioleau, president of the South Carolina Medical Association. Also attending the meeting as guests of the Auxiliary were Dr. and Mrs. D. L. Smith of Spartanburg. Dr. Smith is president-elect of the S. C. Medical Association.

Dr. Prioleau's talk was keyed directly to wives of physicians. He said "Wives of physicians live medicine day in and day out. This Auxiliary is an indication of their interest in it. Its chief purpose is to help them direct their efforts to the benefit of medicine and the public. While you do not practice medicine and are not in the foreground, as wives of physicians, you exert a great influence upon medical affairs. As individuals, and as a group, you can serve best by taking an interest in the solution of social and economic problems so important to the satisfactory practice of medicine. The science of medicine has made great strides and it is now necessary that we pay more attention to the distribution of medical services. If we fail, the government will step in and the changes may not be to the public welfare or to our liking.

A busy physician is inclined to devote his reading time to the science of medicne and to pay lttle attention to the articles dealing with social and economic aspects of the practice. The wife of a physician can help her husband and at the same time do a public service by familiarizing herself with these problems by reading in the lay and professional press. Among the problems are: 1. Advantages to physician and patient of service benefit insurance, such as Blue Cross and Blue Shield, 2. Medical care of military dependents, 3. Medical colleges in the private practice of medicine, 4. Hospital privileges for general practitioners, 5. Federal aid to medical schools, 6. Medical care for veterans with non-service connected disabilities, and many others.

In women's gatherings talk is generally free and often pointed. As women, you are blessed with a keen intuition and can often sense problems and situations before your physicians husband is aware of them. If you are conversant with the subject you can help your husband to a better understanding. As wives of physicians you speak not officially but with authority and you are in a position to use your influence to a great advantage. You are in an unusually favorable position to help solve the social and economic problems which affect the practice of medicine today."

Dr. Prioleau concluded by urging a large attendance from the Auxiliary at the Medical Association Convention in Myrtle Beach in 1957.